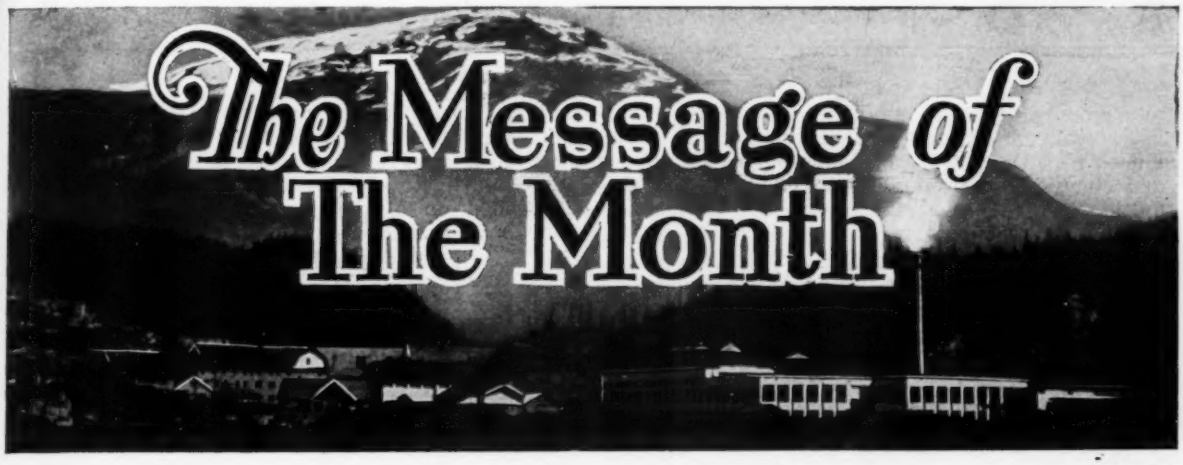

A Challenge to Production Managers

A RECENT report on the state of the Paper Industry in Great Britain has this to say of conditions:—

> "Business is not improving, for on every hand grumbling is heard—merchants are perhaps finding it more difficult to get orders than the mills; but some of the mills are having to scheme so as to clinch orders put up for bidding. It is not good for industry to have such keen price competition, yet it is almost hopeless to expect close adherence to price standards when **supply is so much greater than demand.**"

That might in all truth have been written of the conditions existing in the American markets—it is so pat an example of what overproduction has done to the British market that we quote it for the attention of our American readers.

For the trouble with the British Paper Industry is the trouble with the American Paper Industry—overproduction!

Now all the grumbling indulged in by both British and American paper merchants and mill men will never mitigate the evils of overproduction one mite.

Look the facts square in the face. The United States consumes somewhere near thirteen million tons of paper a year. The potential production being offered and pressed on the reluctant buyers is probably about sixteen million tons. Add to this sum the tonnage of new mills being built and mills financing at the present time, plus additional mills in Canada and new pulp mills in Europe and the sum is one that causes no worry to any paper consumer regarding his supply.

What does any buyer of any commodity do when more goods are constantly pressed upon him than he can buy? Dictates the price, the tonnage he will take and when delivery shall be made.

That is a buyer's market—we not only have had a buyer's market since 1920 but we now have a hand-to-mouth buyer's market.

The only way buyers may obtain dominant possession of the market, is when the mills produce more paper than there is a demand for.

Now production engineers, production managers, production executives, production efficiency experts and promoters of new paper mill projects have had undisputed control of the mills for the past seven years.

All emphasis has been centered upon production—produce more paper—for whom? The consumers don't want it and won't buy it. What are the producers going to do with the excess product? Every market manager knows today that no persuasion nor pressure can be applied to buyers that will induce them to buy or stock one more ton of paper than they are buying now.

They also know that the greater the pressure of the production manager to put product on to the market, the greater the market resistance.

Buyers have resorted to the hand-to-mouth buying policy to protect themselves from the pressure of the over production experts and enthusiasts.

Every buyer of paper in the United States knows that there is a heavy overproduction of paper.

He knows that production executives and

E D I T O R I A L

managers propose to run the mills nights and days every day throughout the year. He also knows that there are many new mills being built and coming into production to swell the already burdensome load of excess paper seeking a market where there is no market.

He further knows that this excess tonnage made and unsold is piling up in the warehouses of the mills making the paper.

He knows that in all probability this excess stock will become a heavy load to some mills and that before long they will be forced to liquidate it at cut prices.

No wise buyer proposes to be caught with paper stock on hand when this liquidation begins; hence, he clings more tenaciously than ever to the hand-to-mouth buying policy.

He buys what he needs or can consume from day to day and lets the mill man pile up his over production which he will buy only at bargain cut prices, and besides he has saved any call carrying charges which the mill takes a loss on.

Its a cinch—the buyers' control of the market is absolute!

There is only one way to change it to a seller's market; that is, curtail over-production and adjust production to market demands.

Production of paper is a glorious avocation when it is controlled, but uncontrolled paper production is like a great volume of water crashing down a river bed uncontrolled. It is not only unprofitable to everyone but a menace and danger to industry.

Our British correspondent well says "that it is not good for industry to have such keen competition, and that it is almost hopeless to expect adherence to price control **when supply is so much greater than demand."**

Over-Production's Partner

ONE of the most noteworthy contributions as food for thought in industry, especially our industry, is the article written by Alexander C. Brown, certainly should make men, keenly obserery Company of Cleveland, Ohio, which appeared in the August issue of "Nation's Business." The partner of over-production is the "purchasing profiteer," he who buys goods for less in time of over-production that is worth more, and keeps the market flooded with goods for which there is no adequate outlet.

Unethical buying habits, as brought out by Mr. Brown, certainly should make men, keenly observant for ways of improving our industry, sit up and take notice. He describes the "purchasing profiteer" as placing orders at cut-throat prices for materials and products to be produced on a quantity production basis, and after the contract has continued for a short span of time, with little or no advance notice, deliveries are suddenly ordered suspended, or so greatly reduced in volume of order that the chance for producing at a quantity-production cost no longer exists. Materials, even those actually in the process of transit are returned to the manufacturer, and to make matters even worse, this same "purchasing profiteer," a little later suddenly orders deliveries resumed, and expects the quantity-production price.

If the manufacturer flinches, or mildly protests, the "purchasing profiteer" gently informs him that he will buy his goods elsewhere if he cannot get whole-hearted co-operation from the manufacturer.

The peculiar ironic angle of his unethical practices, as Mr. Brown speaks of it, is the fact that most of the time he decries destructive over-production and competition in other branches of industry, and is totally unaware of similar practices going on in his own organization.

Then, too, his ability to slide down prices is aptly brought out in Mr. Brown's article. He gives the example of a railroad company buying equipment. They call in various concerns to bid on unit lots of machinery to be purchased, and bait each bidder to lower his price by holding a lower bid as a possibility from another competitor, until they get their sliding price scale down to their respective desires. Then they surprise the bidder of the deal by informing him that they desire this price on one piece of machinery which they intend to purchase instead of a unit lot. If the bidder refuses or squirms a little, the company informs him that they will reject all bids and call in others for new ones.

The common practice of large corporations and "purchasing profiteers" to demand complete detailed drawings of machines purchased—even on standard machines, takes away the last dollar of profit in the sale of the machinery, and furthermore crushes any chance on the part of the manuacturer for development or progress of the machine itself, let alone preventing compensation for the thousands of dollars spent in the development of the machine itself. A very encouraging stimulus for the further development of the machinery industry!

Last, but not least, Mr. Brown brings out the fact, that after all, these unethical methods of purchasing reflect on the buying public, and the condition of industry as a whole throughout the country, and when finally, over-production, hand in hand with its partner the "purchasing profiteer," faces bankruptcy, annual losses, and wasted materials as a boomerang to unethical business practices, he cries out in despair for help from his injured victims.

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EDITORIAL

Lessening Machine Waste

METHODS of reducing paper machine waste formed the subject of a prize essay contest by our Berlin contemporary, **Zellstoff und Papier**, the prize-winning essays being presented collectively in a recent Sonderheft or special issue of the magazine as a kind of symposium. A perusal of the essays convinces us that German paper mill practice has no points of superiority over corresponding American methods.

The problem of lessening paper machine broke is, of course, difficult either to formulate or to solve satisfactorily; for, as pointed out by some of the essayists, the origin of broke may often be traced to causes having their origin in the woodpile. The subject was treated generally under the heading, "How May Paper Machine Waste Be Lessened?" and a number of the essays submitted consisted largely of general observations on the advantages of cleanliness, accuracy, or other golden rule behavior as applied to various parts of the machine. That each type of machine and each variety of stock may breed its own difficulties is as easy to understand as that no single formula for remedying conditions can be devised.

While it was generally recognized that a well informed works manager or superintendent was necessary to oversee operations, it was recommended by some of the writers to place more dependence on automatic regulators, indicators and similar devices and rely in a lesser degree on human hands. As an aid to the elimination of broke, it was satisfactory to note the unanimous approval given to the observance of closer control by constant testing.

Most of the essays submitted dealt with contrivances for overcoming waste of time and material caused by breaks in the sheet on wire and presses, interesting devices being described for preventing a break or tear from spreading across the full width of the sheet. One for preventing a full break in the sheet before it reached the press rolls consisted of a water pipe suspended above the sheet between the last suction box and the couch roll, equipped with three fine squirts placed at equal distances over the width of the sheet. A break being observed as about to start, a valve was at once opened and the sheet divided into four strips by fine streams issuing from three separate nozzles. Even if one only of the four strips remained untorn, it would be enough to preserve the continuity of the sheet, so that it was an easy matter to bring it out to full width again.

In one of the essays, the suggestion was made that the suction boxes be brought close together without any intervening spaces. In this way it was said to be possible to maintain a lower vacuum, as the suction would be continuous and capable of extracting a greater amount of water from the sheet before it passed under the couch roll than was possible with divided boxes—an interesting suggestion if demonstrated to be really capable of affording a more efficient dehydrating action.

To Reform Rosin Sales

AMONG other matters brought up recently at the usual weekly conference of the paper industry press with executives of trade associations in the office of the American Paper and Pulp Association, was the question of modernizing the marketing of naval stores. Rosin and turpentine are classed in market reports and known generally as naval stores. The pulp and paper industry is perhaps the heaviest consumer of rosin, the soap and the paint and varnish industries coming next.

The present system of marketing naval stores, and particularly rosin, has persisted since the early days of rosin manufacture in the South. Of late there have been, on the part of consumers, some open expressions of dissatisfaction with it, and a change has been asked for simpler and more convenient units of quantity. They want, for example, to have turpentine sold by the pound as most other oils are now sold, and rosin purchasable on the basis of a net weight, at a price per pound, rather than according to the old-time arbitrary unit of a 280-lb. barrel.

The subject is not one that has called forth any general expression from paper mill users of rosin, and it is apparent that the agitation for a reform in selling methods has originated with the paint, varnish and soap industries. There is, however, no question about the desirability of the proposed change so far as paper mills are concerned, and the American Paper and Pulp Association has named a suitable committee to cooperate with manufacturers of soaps, paints and varnishes.

While not seemingly in sympathy with the desire for a change in the system of marketing and quoting rosin and turpentine, the naval stores men are not wholly antipathetic in their attitude and have indeed appointed a committee to meet with the consumers' committee to discuss the subject. It is the intention of the consumers of rosin and turpentine to first study the subject from every angle, agree upon an acceptable system of marketing and bring it before the producers' committee for consideration. The joint committee will then undertake a general survey of the situation with a view to the adoption of a revised form of marketing naval stores that will satisfy all parties.

It is felt by those conversant with the points at issue between producers and consumers of naval stores that when the advantages of the proposed new system of marketing are fully presented, all opposition to the movement on the part of producers will disappear, for the advantages of the new method will certainly be as much theirs as anybody's.

THE PAPER INDUSTRY

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Interesting Pulp and Paper Laboratories of Europe

VI.—Cöthen, Anhalt, Germany—The Institute of Paper Technology at the Friedrichs-Polytechnikum

By LOUIS E. WISE, Ph.D.

Professor of Forest Chemistry in the New York State College of Forestry, at Syracuse University

This is the sixth of a series of articles written by Dr. Wise during his European trip to paper and pulp centers of the continent.

DR. HAROLD HIBBERT of McGill University first directed my attention to the pulp and paper course of the Friedrichs-Polytechnikum at Cöthen, and I can do no better than to give him a vote of thanks before plunging into this article.

I entrained for Cöthen, Anhalt, six days after I had spent my pleasant day with Professor Schwalbe at Eberswalde, where the fruit trees were in full bloom and brilliant sunshine was bathing the countrysides of Prussia. But the German climate is sadly fickle, and on the morning of this second trip the three impish spirits who, according to German tradition, are supposed to take matters into their own hands and dislocate the weather for three days each May, were well in the saddle. It was actually snowing in little flurries which vanished between flashes of ænemic sunlight. The sky, too, was wintry, with patches of deep blue, hedged in by heavy grey wind clouds.

The trip into Anhalt was uneventful enough. The train compartment, quite empty at the start, was filled at Dessau, the state capital, with agricultural gentlemen of various heights and girths, who regaled each other with the meteorological exploits of the three spirits, and with experiences in potato culture and rotation of crops, while I sat huddled in a corner trying to keep warm.

In passing, it might be well to say that Anhalt is an energetic German state, neighboring the powerful state of Prussia. Anhalt probably has less than 400,000 inhabitants, but it boasts of important deposits of brown coal, lead, silver, copper and clay, and its salts of potash are exported to all parts of the world. The sugar beet prospers in Anhalt and so does the tobacco plant; and that part of the population which does not devote itself to agriculture, forestry, mining and the like, gives its energy to the trades and industries, which include tool and machine manufacture, chemicals, textiles, sugar, cast-iron, and papermaking. Cöthen lies about in the geographical center of Anhalt, and is one of its "key" cities—not a large town, but one in which Anhalt has made an important educational investment, which it is my purpose to describe in some detail as we proceed.

From the station at Cöthen, I went immediately to the home of Professor Dr. Bruno Possanner von Ehrenthal, who was good enough to offer me his hospitality for the day. This courtesy, so graciously extended to a foreign colleague (and a total stranger), soon took the chill out of the Anhalt climate and made me feel thoroughly at home, "gemutlich," as the Germans put it,—and it certainly left a warm and pleasant memory of Cöthen.

Cöthen's Guiding Hand

Dr. von Possanner, well known among technologists as the author of an important textbook on the Chemical Technology of Paper and as the able director of the Pulp and Paper Institute of the Polytechnic at Cöthen, proved to be an affable, scholarly

Austrian gentleman, slender, middle-aged, with a keen interest in the pulp and paper industry of the world in general, and of Germany in particular. An excellent organizer and persuasive protagonist for systematic, thorough, fundamental education for future pulp and papermakers, he has succeeded in building up a school which deserves the consideration of papermakers far beyond the confines of Germany. It was Dr. von Possanner who was my guide through the Friedrichs-Polytechnikum, who showed me all the equipment in his own laboratories, and who gave me full information regarding the development of the great institute which has done so much for Cöthen and for Anhalt, and for which, in turn, the town of Cöthen has made such great financial sacrifices.

Informal glimpse of Prof. Bruno Possanner von Ehrenthal in his laboratory

History of the School

The "Gewerbe-Hochschule" at Cöthen, better known as the "Städtisches Friedrichs-Polytechnikum" (The Municipal Friedrichs Institute of Technology), found its beginnings in an organization sponsored in 1890 by the town counselor of Cöthen, Dr. Puschmann. Under his guidance, a number of the leading citizens of Cöthen organized a society known as the "Verein zur Förderung gemeinnütziger Unternehmungen"—a sort of idealized Chamber of Commerce, Rotary Club, and Board of Education rolled into one—which undertook to study questions that were of vital and general interest to the town of Cöthen, and which then acted as an advisory committee in bringing their findings, in the form of recommendations, to the attention of the Magistrate and Town Council of Cöthen.

Among the urgent recommendations which these gentlemen made to the town fathers was the founding of an "Academy for Trades and Industries," which should include a business school, a division of mathematics, physics, and technology, and a division of "useful trades." This suggestion was gracefully received by the city of Cöthen, which gave it financial support. It was also furthered by the bankers and industrialists of the town, and was sponsored by the Duke of Anhalt, who acted as protector of the whole project, and whose financial agent allocated rooms, on the upper floor of the ducal coach house, to the new school.

It is not my purpose to relate in detail the vicissitudes which this academy of Cöthen met from the time of its founding in 1891 up to the chilly May day in 1927, when the courteous and efficient Dr. von Possanner piloted me through its new and splendidly equipped lecture rooms and laboratories—but the reader will bear with me, if I give a few of the high spots in its history.

It opened its doors as an Academy for Trade, Agriculture, and Industry in May, 1891, with three students, which a few days later were augmented by 13 more. By 1894, its student body had reached 222 men, who found themselves crowded, not only into the Duke's quarters, but overflowing into rooms and halls of various inns and rooming houses of the city of Cöthen.

Even as early as 1891, the Duke, noting the remarkable increases in the student enrolment, had given his tea house as an auxiliary school building—but as this was almost totally destroyed by fire soon afterwards, the lack of adequate space still embarrassed the director and faculty of the new academy.

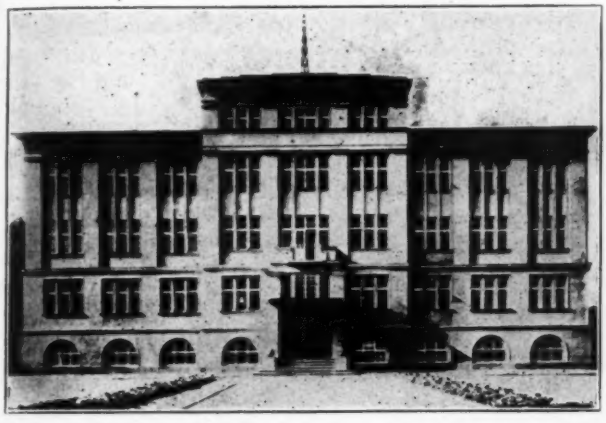
In 1894, the city built the so-called "Gerätehaus," which was fitted with an electro-technical laboratory, a machine shop, an accumulator room, and a lecture hall, but the new building failed to solve the space deficiency. By the fall of 1897, a large new school building had been erected and opened with proper pomp and ceremony by the City of Cöthen, in the immediate vicinity of the City Park, and in 1900, two large wings were added thereto. (These are shown in one of the accompanying illustrations.) In 1904, a large mechanical laboratory building, with boiler plant, machine shops, etc., became a new unit of the school. Despite the rapidity with which the town of Cöthen sought to meet the needs of its foster child, it could not keep pace with the onrushing tide of students. Lecture rooms were always filled to overflowing with a new and ever increasing stream of humanity. The gracious Duke had come to the rescue from time to time by allowing classes to be held in his palace—but the condition was not really remedied.

The fine old main building of the Friedrichs-Polytechnikum, where the papermaking course started with 11 students in 1905

By 1926 the school, which had begun with 16 students, had a roll of well over 1400*—but before

this a large new building had been put under construction and equipped to meet the prodigious growth of Cöthen's great institute.

This new building (also pictured in one of the illustrations) is an Institute of Chemical Technology. It resulted from the unceasing efforts of the Rector



Courtesy of Dr. von Possanner

The new institute of chemical technology of the Friedrichs-Polytechnikum (Cöthen, Anhalt) opened in 1926, which houses the pulp and paper laboratories

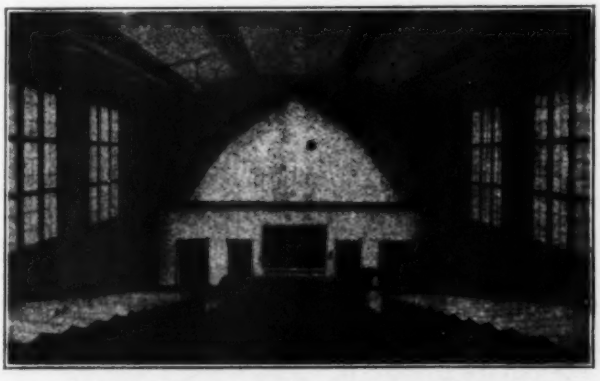
of the Polytechnikum, Dr. Michel. It was formally opened in 1926, during a convention of German Pulp and Papermakers, but it had been pressed into service during the preceding winter. Its ground space approximates 1200 square meters, and it contains an entire series of the most modern type of chemical and technological laboratories, many of which contain equipment presented by the great German industries. It has three lecture rooms, one of which can accommodate 420 students. This new building houses the Papermaking Division of the Polytechnic. Altogether, the new building, with its bright, cheerful interior decorations, its colorful stained windows and modern paintings, and its beautifully lighted rooms, is a venture of which to be proud, especially when we remember that it was conceived when all Germany, including the city of Cöthen, was in the throes of a great financial crisis.

So much for the popularity and material progress of the Friedrichs-Polytechnikum. Now for a hasty resumé of its general educational policies.

General Educational Policies

I believe that it was the third director of the Academy at Cöthen—a certain Dr. Karl Foehr—an experienced industrial organizer and university professor—who sought to define and delimit the functions of the ever growing school. It was his idea that the Friedrichs-Polytechnikum should not be a school for the preparation of pure scientists, nor on the other hand, a mere trade school, but that it should occupy a position intermediate between these two. The school was to combine in proper proportions theory and practice, science and the arts. Dr. Foehr's plan was promptly acted upon and accepted. In 1905, with the consent of the State Ministry of the Duchy of Anhalt, the Academy was raised to the rank of a Polytechnical Institute, which Duke Fredrick II of Anhalt honored with his name. This marked a distinct step in advance. Ten years earlier, the first director of the Cöthen Academy had attempted to convert his institution into a polytechnic, but his efforts had proved premature and futile. Under Director Foehr's leadership, the standards and tone of the institute improved with its rank, and the studies undertaken by the Polytechnikum included five main divisions which were then not quite identical but rather similar to those existing today. They included: (1) Machine Construction; (2) Electrical Technology; (3) Chemical Technology; (4) Mining; (5) Ceramics. The Polytechnikum in its new capacity also strove to introduce subjects of general culture, as well as technical interest, into its curriculum. Its lecture platforms were opened not only to the regular faculty, but to prominent men connected with the management and production of the industries of Anhalt. Purely cultural courses were introduced into the curriculum, and special lecturers were brought in to teach them, and the school very rapidly became an exceedingly important factor in the life of Cöthen, and in the educational system of Anhalt.

In the same year in which Dr. Foehr introduced such drastic reforms, i. e., in 1905, a course in pulp and paper manufacture was brought into the school. As the reader may guess, the association of German Paper Manufacturers (Verein deutscher Papierfabrikanten) had been approached and stood solidly

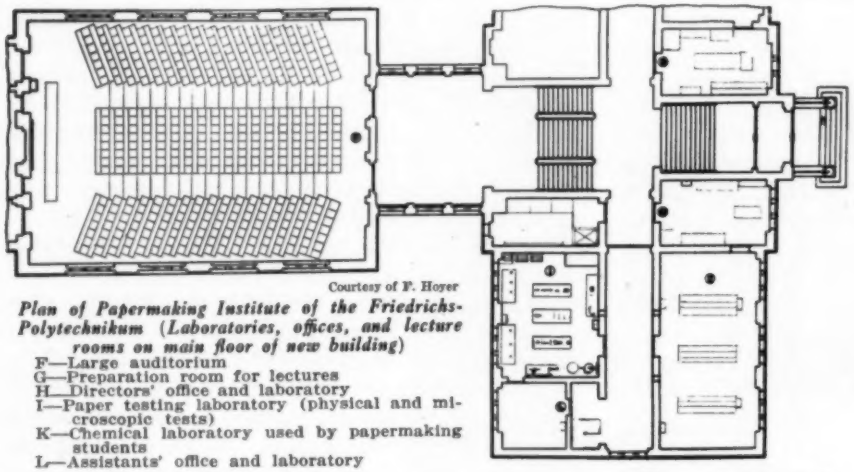


Large modern auditorium (also shown in plan) in the new Chemical Technology Building at Cöthen

back of the new project. The course, like the others given by the Polytechnikum, which had been readjusted under Foehr's guidance, was normally a 7-semester course, (3½ years) with two comprehensive examinations coming respectively at the end of the 4th semester (the second year) and at the end of the final semester. The successful student

*In 1923 the student roll had reached 1900 men, but this dropped somewhat after the deflation.

then received his engineering degree. However, if he wished it, the student could so order his studies that after 5 or 6 semesters of very intensive work he could become a candidate for the "Joint Examination of the Association of German Paper Manufacturers." We shall have something more to say of these examinations later on.



Courtesy of F. Hoyer

Plan of Papermaking Institute of the Friedrichs-Polytechnikum (Laboratories, offices, and lecture rooms on main floor of new building)

F—Large auditorium
G—Preparation room for lectures
H—Directors' office and laboratory
I—Paper testing laboratory (physical and microscopic tests)
K—Chemical laboratory used by papermaking students
L—Assistants' office and laboratory

Course of Study

In order to be admitted into the Polytechnikum, and into the course in Papermaking, regular students must have reached the age of 18. They must also have had, as a minimum, one year of practical experience. They must have satisfied requirements which, by and large, correspond to graduation from one of our large American high schools—i.e., a diploma from a German "higher school" having 9 classes, or a diploma from a 6-class German "Realschule." However, in special cases the students may be technicians, who have successfully completed the course in a technical trade school, and who have then had at least 2 years of practical experience. Certain groups of teachers are also admitted.

The course in papermaking fits into the Division of Technology of the Polytechnikum. These divisions and subdivisions as they are maintained today are:

I Mechanical and Civil Engineering
- (a) Iron constructions
- (b) Re-enforced concrete constructions
- (c) Roads and highways
- (d) Hydraulic engineering

II Electrical Engineering
- (a) General electrical engineering
- (b) Long-distance communication

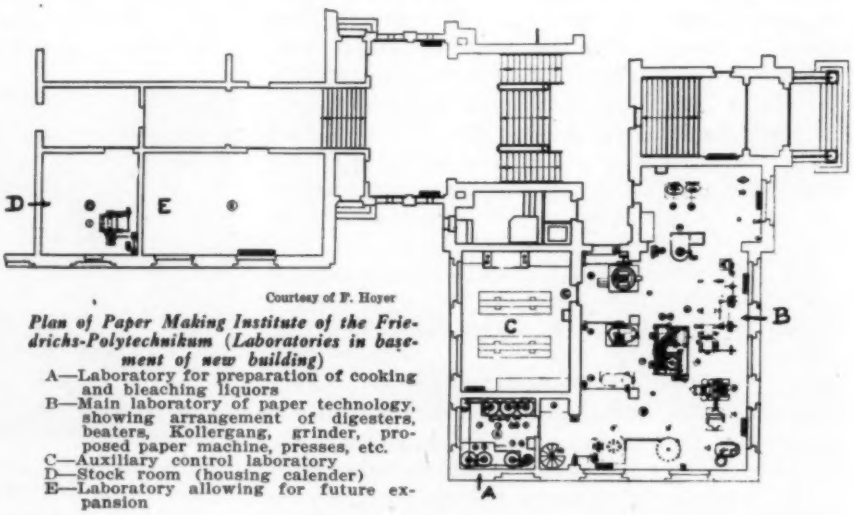
III Technical Chemistry
- (a) General chemical technology
- (b) Electro chemistry
- (c) Photo chemistry
- (d) Gas technology
- (e) Sugar technology

IV Technology
- (a) Mining
- (b) Ceramics
- (c) Cement technology
- (d) Glass technology
- (e) Iron-enamel Technology
- (f) Paper Technology

V General Division
Maintained with special reference to business administration.

The nature of the work in papermaking, which has progressed steadily under Dr. von Possanner's direction, can be gauged from the condensed schedule of courses given below. The work leads to the degree of **Papieringenieur** (Engineer in Papermaking), and the curriculum is comparable with that of the French School of Papermaking at Grenoble, and with our own collegiate courses in pulp and papermaking in the U. S. A.

It should be understood that at Cöthen, as at nearly all other German institutions of learning, the academic year is divided into a "summer" and a "winter" semester.



Courtesy of F. Hoyer

Plan of Paper Making Institute of the Friedrichs-Polytechnikum (Laboratories in basement of new building)

A—Laboratory for preparation of cooking and bleaching liquors
B—Main laboratory of paper technology, showing arrangement of digesters, beaters, Kollergang, grinder, proposed paper machine, presses, etc.
C—Auxiliary control laboratory
D—Stock room (housing calender)
E—Laboratory allowing for future expansion

The winter semester begins late in October and continues until early in March. The summer semester starts about the middle of April and continues

until the latter part of July. There is a two weeks' recess at Christmas, and a ten day recess late in May or early in June. Since students may matriculate either before the winter or summer semesters, their schedules are arranged accordingly. Sometimes, therefore, a given course may be taken either in the summer semester or in the winter semester, depending on whether the student entered the Polytechnic in the summer or winter. Hence there are always two possible schedules. To avoid confusion, the schedule which follows assumes that the student entered in a winter semester.

SCHEDULE OF COURSES FOR PAPERMAKING STUDENTS, LEADING TO THE DIPLOMA OF ENGINEER IN PAPERMAKING

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Mathematics—Algebra, Trigonometry and Solid Geometry	3	1
Descriptive Geometry	1	3
Physics—Optics, Magnetism and Electricity	4	
Physics—Laboratory		2
Inorganic Chemistry	3	—
Mechanical Technology—Fuel, iron, steel, other metals, alloys, various technical raw materials. Practice in forging, pressing, pouring, hardening, soldering, etc.	1	1
Business Administration	2	
Mechanical Arithmetic	1	
Machine Design		6
Technical Report Writing		1

SECOND SEMESTER

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Mathematics—Analytical Geometry, Differential and Integral Calculus	2	1
Technical Mechanics—Mechanical Engineering	5	2
Physics—Mechanics, Acoustics, Heat	4	
Physics—Laboratory		2
Inorganic Chemistry	2	
Stochiometry—Chemical Calculations	1	
Inorganic Chemical Laboratory—Qualitative, Analysis, etc.		12
Business Administration	2	
Commercial Arithmetic	2	
Machine Design		6

THIRD SEMESTER

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Technical Mechanics—Mechanical Engineering	4	2
Electrical Engineering—Elementary	2	
Machine Elements	1	3
Stochiometry—Calculations	1	
Inorganic Chemical Laboratory—Quantitative Analysis		12
Elementary Organic Chemistry	1	
Elementary Industrial Chemistry	1	
Heating—Chemistry of Combustion, fuels, specific heat, calorimetry, thermometry, heat conductance, etc.	1	
Building Construction—Wood, stone	2	3
Bookkeeping and Accounting	1	2

FOURTH SEMESTER

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Electrical Engineering	2	
Electrical Laboratory		2
Mechanical Engineering	2	
Mechanical Engineering Laboratory—Testing of materials		3
Chemical Colloquium—Review of Elementary chemistry in the form of dialogues	1	
Quantitative Analysis—Gravimetric and Volumetric	2	
Paper Laboratory Exercises—Volumetric and gravimetric analyses connected with the paper industry; chemical examination of raw materials and finished products. Also experiments with digesters, beaters, and small scale pulp and paper equipment		12
Seminar in Industrial Management		2

FIFTH SEMESTER

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Electrical Engineering Laboratory		2
Heat Engines	4	
Mechanical Engineering Laboratory—Experiments with machinery,—operation, heat consumption, efficiency, etc.		3
Hydraulic Engines—Hydraulic, general material on turbines	2	
Pumps	2	
Conveyors—Different systems in use, cranes, elevators, etc.	1	
Factory Location—Choice of site, question of raw materials, power, labor, disposal of waste, legal considerations	1	
Civil Engineering—Elements	2	
Papermaking Machinery—Equipment used in the preparation of mechanical and chemical pulp; construction, uses, power consumption, output, etc.	2	2
Paper Technology—Raw materials and half-stuff. Discussion of water and fibers used in the industry. Preparation of cooking and bleaching liquors, coloring matters, fillers; mechanical and chemical pulp production; cooking of rags, etc.	3	

Paper Laboratory Exercises—Continuation of work outlined above		12
Organic Chemistry	2	

SIXTH SEMESTER

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Hydraulic Machinery		3
Hydraulic Machinery	2	
Pumps—Construction		3
Paper Technology—Production of paper, bleaching, beating, formation of sheet. Discussion of different types of paper machines; drying and finishing	3	
Paper Testing—Physical and microscopic tests on the finished product		2
Manufacture of Special Papers—Colored and coated papers, carboard, etc.	1	
Papermaking Machinery—Detailed discussion of construction of machinery used in pulp sheet, paper, and cardboard manufacture, with laboratory tests. Calculations and experiments on power consumption, steam consumption, efficiency. Auxiliary equipment used in papermills. Calenders, slitters, etc.	1	2
Paper Testing—Lectures on the physical and microscopic tests, and chemical examination of paper for dyes, size, fillers, etc.	2	
Coloring of Paper—Discussion of the natural and synthetic dyes used in papermaking, methods of testing for them; coloring experiments	1	
Location of Papermills—Fundamentals to be considered in the construction and site of paper and pulp mills. Transportation; the question of raw materials, power, water supply and purification, waste liquors; special constructions in case of groundwood, cardboard, strawboard, etc. Reconstruction of old mills. Labor problems, sanitation, etc.	3	
Paper Laboratory Exercises—Continued		12
Factory Layouts	1	

SEVENTH SEMESTER

COURSES	HOURS PER WEEK Lecture	Laboratory or Recitation
Hydraulic Laboratory		3
Testing of Papermaking Materials—Lectures on the examination of raw materials and chemicals, such as water, fibers, cooking and bleaching liquors, size, fillers, and dyestuffs	2	
Chemistry of Cellulose	1	
Calculations Used in the Paper Industry	1	
Layout and Location of Papermills		3
Paper Laboratory Exercises		18
Special Phases of Pulp and Paper Engineering	2	

The student is also expected to submit the results of an experimental problem in the field of pulp and papermaking, carried out during the final semester.

Besides the foregoing courses, the student for an engineering degree is advised to take the following:

Construction of simple buildings.
Machine elements.
Chemical technology.
Free-hand drawing.
Seminar in strength of materials.
Seminar in heat engines.
Financial, industrial questions.
Civil and business law.
Industrial calculations.
Statistics.
Seminar in economics.
Taxation.
Patents.
Industrial organization.
Balancing of accounts.

At the end of the first four semesters, during which the fundamentals are stressed and which include very little work in papermaking, the student may present himself for a **preliminary** examination. This covers the required field of mathematics, elementary mechanical engineering, technical mechanics, business administration, and besides these, three other subjects chosen by the candidate with the consent of his examining committee. Successful candidates receive the "vorprüfungszeugnis" (certificate for having passed the preliminary examination).

After the seventh semester has been weathered, the student presents himself for the **final examination.** This covers the field in which the candidate has specialized, and three allied subjects, which are chosen with the consent of the director of the papermaking course and the examining committee. This committee consists of the director and the various instructors, acting under the chairmanship of the State Commissioner (appointed by the ministry of the State of Anhalt). The student who passes this final examination successfully receives the engineering diploma.

The polytechnikum also offers a somewhat shorter papermaking course, terminated with the "Joint Examination of the Association of German Papermanufacturers" (Verbandsexamen des Vereins deutscher Papierfabrikanten). Ordinarily this is a six-semester course, but if the candidate has had a sufficient background of practical experience, it may at times be shortened to five or even four semesters. The first four semesters of the course are identical with the first four terms of the course in papermaking engineering, outlined in the accompanying schedule. The courses offered to the "association" students during the 5th and 6th semesters are the following:

FIFTH SEMESTER

COURSE	HOURS PER WEEK Lecture	Laboratory or Recitation
Electrical Engineering Laboratory		2
Elementary Study of Heat Engines	4	

Mechanical Engineering Laboratory		3
Hydraulic Machinery	2	
Pump Construction	2	
Conveyor Systems	1	
Factory Planning	1	
Elementary Civil Engineering	2	
Paper Technology	3	
Testing of Papermaking Materials	2	
Chemistry of Cellulose	1	
Calculations Used in the Paper Industry	1	
Paper Mill Machinery	2	2
Layout and Location of Papermills	3	
Paper Laboratory Exercises		12

SIXTH SEMESTER

COURSE	HOURS PER WEEK Lecture	Laboratory or Recitation
Hydraulic Machinery		3
Hydraulic Machinery	2	
Hydraulics Laboratory		3
Pump Construction		3
Factory Planning	1	
Paper Technology	3	
Paper Testing	2	
Paper Coloring	1	
Production of Special Papers	1	
Paper Testing		2
Papermill Machinery	1	2
Layout of Papermills		3
Paper Laboratory Exercises		12
Special Problems in the Pulp and Paper Industry	2	

Besides these courses, for which the student is held responsible in the examination, he is advised

Courtesy of Dr. von Possanner

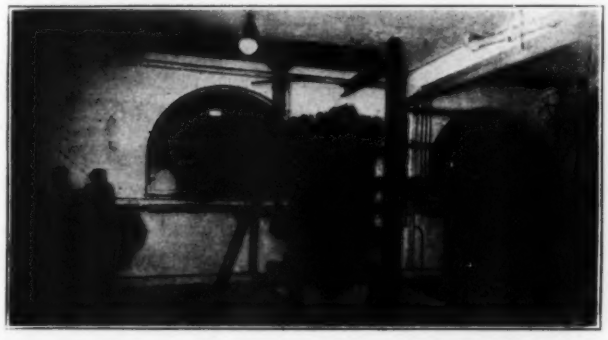
Newly equipped paper testing laboratory of the Friedrichs-Polytechnikum

to attend, if possible, the same elective courses that are recommended to students in papermaking engineering.

After the first four semesters' work has been completed, the "association" student is also required to pass a preliminary examination. The subject matter of this test includes: mathematics, technical mechanics, elementary mechanical engineering, general chemistry, elementary electrical engineering, and one other subject chosen by the candidate.

At the end of the 6th semester, he presents himself for the final "Verbands examen" (Association examination).

The personnel of the examining committee is interesting. The rector of the polytechnic serves as



Courtesy of Dr. von Possanner

Triumvirate of digesters in the paper and pulp technology laboratory at Cöthen

Left—Digester for preparation of brown pulp
Center—Sulphite digester
Right—Experimental soda digester
The capacity of each case is about 800 liters

chairman. The examiners include the director of the papermaking course, the instructors in the various courses, a state commissioner, and a commissioner representing the Association of German Paper Manufacturers. The interest of the papermakers of Germany in the work of the Polytechnikum is assured in this way. Since the fate of the candidate is decided by the majority vote of the committee, the manufacturers' representative may play an important part. However, the state commissioner's voice decides the fate of the student, in the case of a deadlock.

The final examination covers the subject matter of the so-called "prüfungsarbeit" (a constructive or experimental pulp and paper problem carried out during the final semester), as well as the subject matter of the entire field of pulp and papermaking, including the layout of pulp and papermills, mechanical and chemical pulp manufacture, papermaking, testing of raw materials and paper, general and special machine design, accounting, etc.

I have gone into some detail regarding the education of papermaking students at Cöthen for several reasons. First of all, the courses indicate where the German industrialists place the emphasis in the development of the future papermaker. Secondly, they form an interesting and sharp contrast to our own pulp and papermaking courses. Finally, they indicate the difference between European teaching methods and our own.

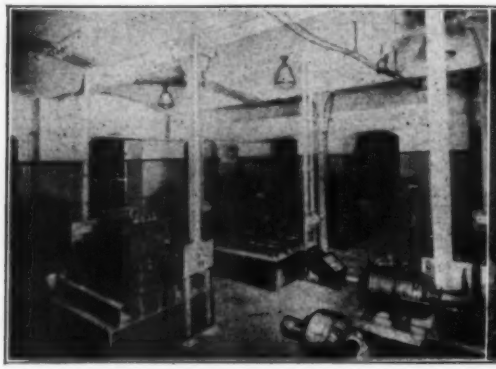
Comparison of Teaching Methods

For example, the chemistry of wood and cellulose, and the microscopic study of wood and textile fibers (raw materials of the pulp and paper industry) do not receive the attention at Cöthen that we give these subjects at Syracuse. On the other hand, certain special branches of engineering are handled in much greater detail than we are able to devote to them. However, the actual courses in pulp and paper technology, paper testing, etc., run almost parallel in Germany and in the U. S. A.

The fundamental differences between our methods of teaching and those used in Europe become apparent immediately on surveying the work outlined in a given semester—especially in the case of "association" students. On paper at least, the German student has a much heavier study program than has his American colleague. In a given time he is usually expected to take more courses than is his American brother, and his time appears to be more fully occupied. This difference is only apparent, however. In America, our students often take fewer subjects **per annum,** but they are subjected to greater pressure than are the German students. The Americans have "stiff," comprehensive examinations at frequent intervals (ordinarily **two** per semester, in a given subject); they are often checked up by written and oral quizzes. Besides this, they are frequently called upon to submit laboratory books, and reports on their practical experiences to the instructor, who grades them on their work. All in all, it appears to the writer that the American undergraduate is often in closer personal touch with his professor than is the German student, and that the American instructor acts **in loco parentis.**

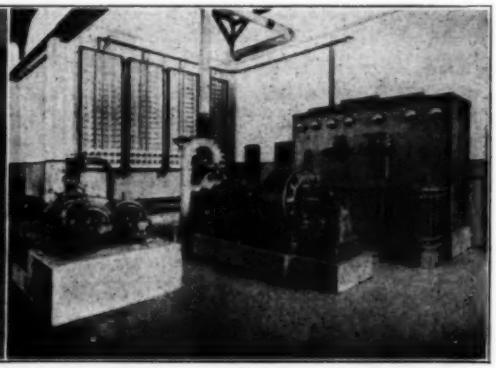
Whether or not the Continental method of examining the student only twice during 3 or 3½ years and of leaving the question of regular study to the student himself is actually a better one, is a question that I cannot answer. With mature students, the German method appears to be better—and the students at the Polytechnikum are usually older than are our American undergraduates.

That the German students are not too old and decrepit is evidenced by their interest in athletics. Some form of physical education or "sport" is required for each student in residence at the Polytechnikum. This requirement is termed "pflichtsport" (compulsory physical training). Only those students who are judged unfit, after a medical examination, are excused. This is a new departure for a German technical school, and bears a remarkable resemblance to our American athletic or gymnasium requirements. It has only taken hold since the young German is no longer given compulsory military training, which the pflichtsport replaces quite satisfactorily.



Electrical engineering laboratory

Experimental grinder for mechanical pulp



One of the engineering laboratories, showing steam turbine

The Institution Laboratories

No one can question the complete success of the papermaking course at Cöthen. When it began in 1905, there were 11 enrolled students. In 1926, its enrolment approached 100. Many of the graduates have climbed into responsible jobs during the past two decades. They have "made good," and have helped in giving the school the excellent reputation which it enjoys among German paper manufacturers. Quite often there are more vacancies in the German industry than there are young Cöthen graduates to fill the jobs!

The new laboratories at the Polytechnikum merit more than a passing reference. Besides the space devoted purely to chemistry, physics, and engineering, the new Chemical Technology Building has: (1) **an analytical laboratory** devoted to the qualitative and quantitative analysis of papermill chemicals, pulp and paper, and to small scale experiments; (2) an excellent **physical pulp and paper testing laboratory;** (3) a room devoted to preparation of **liquors** (for cooking and bleaching); (4) a spacious laboratory devoted to **pulp and paper technology;** (5) a small adjourning **control laboratory,** run in conjunc-

tion with (4); (6) private offices and laboratories of the director and his staff. The arrangement of these rooms, and their interrelationship is shown in the two floor plans.

Professor von Possanner has spent a great deal of time and thought on the arrangement of his equipment, and he has never hesitated to call upon the pulp and paper industries and the machine manufacturers for assistance and advice. He is a past-master in the difficult art of obtaining gifts—and very remarkable gifts—from the industrialists. Not long ago, he estimated that the permanent pulp and paper equipment **presented** to the school had a cash value of over 28,000 marks, i.e., $7,000.00!

As an example of this donated equipment, I must mention the remarkable Schopper electrical drying oven, with its predrying unit, its final drying unit, and its built-in balance, for determining the moisture content of pulp. As in the case of the Aribert oven in Grenoble, representative pulp samples may be dried therein to constant weight, without removing them from the oven.

Another example of the manufacturers' generosity is a folding endurance tester for cardboard. Needless to say, the physical testing laboratory, which is a very spacious room, is replete with all the modern German physical testing instruments. It is beautifully lighted and equipped, and is the best laboratory of its kind that I have seen in Europe.

Perhaps the most valuable gifts are to be found in the laboratory devoted to pulp and paper technology. Among the equipment in this room we find (1) a rotary digester for soda and sulphate cooks, capacity 800 liters, built to operate at 12 atmospheres pressure; (2) a stationary sulphite digester, properly lined, also having a capacity of 800 liters; (3) a horizontal digester, having approximately the same capacity as its companions, used in steaming wood in the preparation of brown pulp; (4) a crazy chase, with bed stone 83 centimeters (about 33 inches) in diameter; (5) a remarkable, unique experimental grinder for mechanical pulp, with devices for carefully regulating the pressure with which the block is brought against the face of the stone, which is 25 centimeters in width, and 60 centimeters in diameter, and for varying the grinding surface; (6) an experimental beater, with changeable rolls, and provided with a washing cylinder (capacity 200 liters). Careful inspection of the floor plans will show that there are other pieces of equipment, tanks, beaters, pumps, bleachers, etc., which I have not taken the time to describe. In the storage room, a calender awaits the coming of an experimental paper machine, gift of a prominent manufacturer!

So much for the equipment of this large and ever-growing Institute of Paper Technology, which grew from small beginnings on the top floor of the stately old building of the Friedrichs Polytechnikum, and is still forging ahead in the ultra-modern Chemical Technology Building at Cöthen. The Polytechnikum is a monument to the State of Anhalt, and the Institute of Paper Technology is its keystone. Pure scientists and technologists alike, throughout Germany, are enthusiastic about its equipment and its personnel, and my experience has shown that they are justified in this opinion.*

A Unique Collection

I cannot leave the Paper Institute at Cöthen without making some reference to its remarkable collection of watermarked papers. Here Professor von

Courtesy of Dr. von Possanner

Reproductions of two remarkable examples of the watermarking art in the collection at Cöthen

Possanner looms up as an æsthete and connoisseur. This collection, much of which came as a gift from the widow of the late Dr. Eugen Fuller, contains some forty fine museum pieces. Most of the watermarks are the creations of Italian and Russian craftsmen of the highest calibre and a number of them are beautiful copies of famous paintings. The value of the collection can hardly be estimated. Through the courtesy of Professor von Possanner, reproductions of two of the most elaborate of these watermarked masterpieces have been included in this article.

Conclusion

As I sit in the compartment of the Berlin-bound express, one frosty night in May, a number of thoughts jog into my mind. The polytechnikum at Cöthen, with von Possanner at the helm of its papermaking course, is decidedly a "going concern." It forms one of Germany's fountainheads for soundly trained, intensely practical pulp and papermill technologists. Many of the future mill executives will undoubtedly come from Cöthen, with its fine laboratories, its enthusiastic staff, and its remarkable equipment. It has the backing of the entire German industry.

And then—as the train gathers speed—comes another thought. The institution, efficient as it is, is not purely materialistic. Culture and beauty find

* The question has been asked: "Does the institute foster research?" While individual instructors carry out investigative work, the function of the polytechnikum is not that of a research institution. It corresponds to our undergraduate engineering schools, and not to our great institutes of technology.

their home within the brilliantly colored walls of its cheerful, new building. Its graduates must be more than well-taught technical experts. For I recall with a sense of joy the shadows and high lights of those treasured watermarkings which Dr. von Possanner held up for my inspection.

Lessons in Paper Making

Lesson XIV—Sewing The Wire

By HARRY WILLIAMSON
Class Instructor, Champion Fibre Co., Canton, N. C.

This article is the fourteenth of a series of lessons in practical paper making, appearing each month in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course conducted by this company under the direction of Mr. J. Norman Spawn, educational director.

BECAUSE of increasing speeds and subsequent increase in production per hour, we are rapidly changing our point of view in relation to this question of sewing the wire.

To shut down a modern machine, spot the crack in the wire, sew it up and start up again, that is from saleable paper to saleable paper, means a lost production time of from forty-five minutes to one and a half hours.

With an overhead charge of $60.00 per hour, the average for a modern machine, we have cause for serious consideration as to the advisability of spending time sewing, or shutting down to put on a new wire.

Local operating conditions must always have a bearing on this question. Machines which shut down two or three times a week for color changes are not liable to suffer **extra** lost time for re-sewing the wire. It is solely a question of comparative values. Lost production time in dollars versus the cost of the wire per day in dollars. This latter value can best be arrived at by fixing a minimum running period for the wire, based on average conditions, and dividing the cost of the wire by the average tonnage produced during that period. By this method the sales manager has a fixed wire cost per pound of paper produced on which to base his calculations. Any **increase** in this cost would be caused by an **accident** to the wire during its handling and operation, or a **defect** in the weave which, being noted when first examined, could be anticipated and its ill effects guarded against.

Any **decrease** in this cost would be **earned** by the opinion of the superintendent as to whether the wire would run safely to the next regular shut down period without costing lost production time in repairs. In this expression of opinion on wire condition, the best among us can easily go astray. Unfortunately we are still obsessed with the old idea of **days run,** rather than **saleable paper produced.** There are also many paper makers who can make such an excellent job of sewing a wire, we are tempted when such a man is available, to spend time sewing an old wire when the actual cost in dollars and cents is really against such action. While it will always be a matter of opinion as to **when** time shall be spent in sewing a wire, **every machine tender** and **tour foreman should be sufficiently practiced** so that he can sew wire, should **emergency** make it imperative.

This does not mean waiting until a crack appears in an operating wire and then making a botch job by practicing. The old experienced paper maker is generally a good hand at wire sewing, and as was the case with this writer, his various employers probably paid dearly in lost time production while he painfully acquired his dexterity.

Experience in wire sewing can be gained while the machine is running steadily, or by those sufficiently interested, by a little home practice. Make a wooden frame about eighteen inches square. Stretch tightly over it, duplicating the tension of the wire on the machine, a piece of **well worn wire.** Cut a clean slit in it with a sharp pen knife and sew it up again. Note the time when you start, and remember two things:

1—The sewing must be good enough to make saleable paper;
2—**The overhead charge is one dollar per minute.**

If you have never sewn wire before, you will be interestingly surprised.

Granting the necessity to be **able** to sew in emergency, and the fact that **personal opinion** under varying local conditions will decide **when** it is advisable to sew, we need **standard factors** to help form our opinion, and information on **how** to sew.

Guides to Opinion

The older the wire, the more worn, consequently the strands of wire which constitute the weave are **wider** and **thinner.** The wire **mesh** is therefore **closer** than the original weave. The **new sewing wire** is of greater bulk than the wire to be sewn. Outstanding

bulk in a small local area of wire will offer an obstruction to the **flow** of the suspended fibers and prevent them from forming together over the bulky area. Therefore, if a **light weight** sheet is to be made after the wire is sewn, the **finest** sewing wire must be used.

The **mesh** of the wire must be **strong** enough to permit each stitch to be **pulled tight.** A crack very close to the **seam** is the most difficult of all to successfully repair, because when sewn it will be **less flexible** than the rest of the wire. **A new wire,** damaged when putting on the machine, can be sewn to give good service because the bulk of the sewing wire will be the same as the weave, and each stitch can be pulled **very tight.**

Pulling stitches tight and rubbing them down means a bulk over the sewn area more nearly equal to the surrounding mesh. Therefore, the strength of the mesh in relation to tightening the stitches is the guiding factor. To make a good sewing job of a wire which has to make a light weight sheet at a high speed, **the wire mesh will have to be strong.** Heavier basis weights and slower speeds will permit a wire sewing of greater bulk.

Sewing Wire

Use two crochet needles, one fine and the other coarse. The fine one is for use in the corners of the crack, and the coarse one will give you increased speed sewing the body of the crack. Do **not cut** the sewing thread with a knife. Even a sharp knife

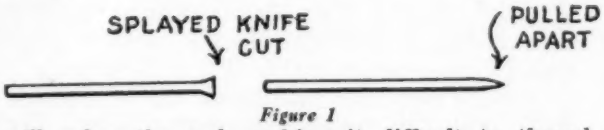


Figure 1

will splay the end, making it difficult to thread through a well worn mesh.

Pull the sewing wire apart. This will cause it to stretch out and the breaking point will have a smaller diameter making it easier to thread. When sewing, hold the needle in use between the lips, parallel with the lips, replacing it after each stitch **with the hook turned the same way.**

Do not lay the needle on the wire. Picking the needle off the wire in haste means **striking the wire with the thumb and forefinger every stitch.** sewing wire in a hurry is a severe muscular and nerve strain. Observance of these little details **lessen** the strain and mean subconscious accurate movement.

Start sewing by threading the wire through the mesh about three squares **above** and three squares to the **left** of the corner of the crack. Pull the wire through the crack and re-thread through a square in a corresponding position **below** the crack. This will form an **anchor stitch** in the corner and will materially help to stop the crack from spreading laterally. Do not use more than eight inches of sewing wire at a time. More than this will be in the way, liable to loop and break.

It is not advisable to sew more than ten stitches with the **same** piece of sewing wire. Threading the wire through the mesh, catching it with the needle hook and pulling it tight, tends to crimp, stretch and weaken the sewing wire; therefore ten stitches with the same piece is plenty. Stagger the stitches mak-

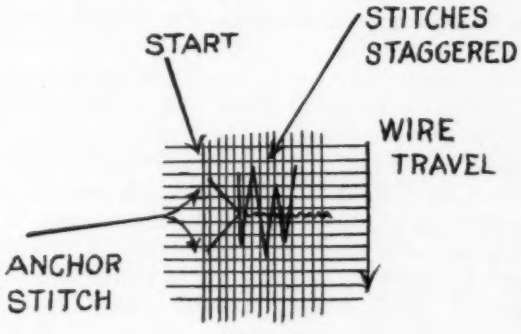


Figure 2

ing a long stitch above and a short stitch below the crack alternately. This will distribute the strain and lessen the bulk.

With the end of each set of stitches, cut the sewing wire off close to the mesh. After the sewing is complete, rub the whole area with the **flat steel back** of a pocket knife. Do this rubbing in the shape of a figure eight. If the sewing is rubbed, a slack place will be formed which will cause a **wet spot** in the sheet. Rubbing over the larger area **spreads the slack** and **disperses** it.

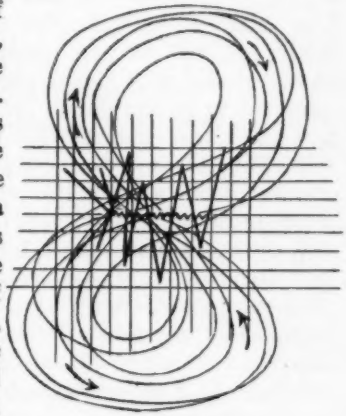


Figure 3

Sewing Wire Edge

As the paper is not to be formed on this sewing, the work is much easier. Coarser wire with greater

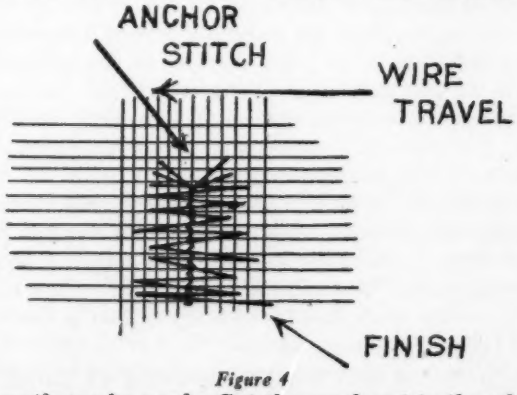


Figure 4

strength can be used. Cut the crack out to the edge; this does away with using a needle. Finish the sew-

ing up the wire against the direction of travel. Should the last stitch work loose, it will not catch on the suction boxes or guide spade.

Wire Ridges

A wire ridge is perhaps better described as a **longitudinal slack place of equal dimensions running the whole length of the wire.** Wire ridges are either convex or concave.

If convex, they have been made by some action of contact on the **inside** of the wire, causing a greater **tension** or stretching over the ridged area than that applied to the rest of the wire. A convex ridge will show a **light** streak in the sheet. A concave ridge is made by a similar action on the **outside** of the wire, and will show a **heavy** streak in the sheet. Stock gathered on an inside roll is the most probable cause of convex ridges. During a start up, before the sheet is properly formed on the wire, is the most dangerous time for fine fibers to work through the wire mesh and gather on the inside rolls.

The shower, if kept clean so that pressure is equally distributed will take care of the stretch roll. The tube roll between the suction boxes and the dandy roll, and the wire guide roll, however, have no showers, and with a free fibered stock are particularly apt to gather fibers. It is a good plan to keep a wooden tray immediately under the dandy tube roll. Then this roll can be washed off without knocking the stock around the wire stretch roll. When washing the stock off either the tube roll or the guide roll, use a small nozzle hose under high pressure. Aim the water pressure at the stock on the roll at a point **nearest the back side,** gradually working towards the **front side.** This will break the stock into small particles and lessen the danger of rolling it into lumps big enough to bulge the wire.

Convex ridges can also be caused by lumps of stock or pitch sticking to the edge of the suction boxes or filling up and protruding from the holes in the suction box covers. Occasionally they can also be caused by a continuous stream of water running around the breast roll, permitted to do so by a worn spot in the doctor blade.

Concave ridges are generally caused by some hard substance, such as pitch sticking to the underneath side of the apron lip. The weight of the mixed volume continuously pressing this hard substance on the wire will cause an uneven stretching. A shower pipe **behind** the breast roll with its spray directed at the junction of the apron and wire will materially help to guard against the danger. Stock sticking to the wash roll will also cause a concave ridge, but as the wash roll is equipped with a powerful shower and also a doctor, it is rarely the cause of this particular trouble.

Keep the shower pipes operating effectively, the doctors in good condition, watch the suction box covers, and an alert eye on the inside rolls after a start up, and there will be little danger of ridging the wire.

Rubbing Ridges

Convex rigdes can be rubbed down while the machine is still making paper. Use an electric light bulb or an ordinary teaspoon—a rounded smooth surface and press gently and steadily over the ridged area. With the wire guide roll for support, the paper is dry enough at this point to permit a gentle pressure, and quite good results can be obtained by careful rubbing.

After the rubbing is completed, **tighten down the stretch roll a little.** The rubbing has flattened out the ridge, but the ridged area is still **stretched longer** than the rest of the wire. Putting down the stretch roll will **equalize the tension.**

We cannot emphasize too strongly that **the wire is not elastic.** It retains the length to which it is stretched.

If the ridge is not too prominent, the rubbing effectively **disperses the small slack area over a larger area.** This stops it from registering a distinctive streak in the sheet. **But the slack is still in the wire until the tension is equalized by the stretch roll.** Concave ridges, depressions on the surface, and ridges on the inside of the wire, are best handled during a shut down. Using a good wire brush held firmly in both hands, brush with steady even strokes **from** the center of the concave depression alternately to each side. Again it is simply the principle of dispersing the slack over a greater area.

When a wire has once been ridged, great care must be used in handling the **shake** during a start up, particularly if a long stroke is used. It is a mistake to apply the shake to an **unloaded wire** at any time. It is particularly dangerous to do this to a ridged wire. Without the steadying weight of the mixed volume and the holding action of the suction boxes, **a long shake stroke will tend to shiver the slack ridged area into a wrinkle.** Apply the shake after **the suction boxes are sealed.**

Bulges

A bulge is a localized **slack area of unequal dimensions,** probably caused by the single passage of a hard substance between the dandy roll and the wire. A bulge can also be caused by carelessly washing stock from the guide roll and allowing it to run around the stretch roll in a lump. These are difficult to repair merely because **there is more slack wire to dispose of than the immediate local area can effectively assimilate.**

If very bad, it is better to cut a longitudinal or diagonal slit about ¼ inch wide in the center of the slack area. Then sew up this slit and pull the stitches **very tight.** By this means most of the slack is disposed of. This is a drastic remedy and should only be attempted if the mesh is **strong enough** to permit

tight stitching, and a good wire sewer is available.

If the bulge is not very bad, cover the damaged area with a thick coating of grease, mix a dilution of 25 per cent water with 75 per cent vitriol and apply to the immediate area surrounding the grease covered bulge. After a few minutes wash the acid from the wire with fresh water and clean the grease off with kerosene. Use a wire brush as for a ridge, and brush from the center of the bulge into the acid treated area. The action of the acid is to **soften** the surrounding wire so that it can more easily **assimilate** the slack from the bulged area.

Run the wire around until the first part of the acid bathed area is under the stretch roll, **tighten down the stretch roll a little,** move the wire a very little at a time, putting the stretch roll hard down **until the whole of the affected area has received the tension.**

This lesson is not intended to cover the detail of every possible emergency. It is intended, however, to lay down broad general principles so that the inexperienced will gain benefit from the costly experience gained by others in the past. In these competitive days when profit is figured to the second decimal place in cents per pound of paper, the machine tender is almost a deciding factor as to whether a profit or a loss will show on the books.

Prevention is better than cure. Study the wire and its possibilities. Bring your own thought to bear on the problems before you, and you will derive much more benefit than the perusal of this lesson can give you.

You owe the best you can give to your employer, and far more important than that, as paper making is your trade, **you owe the best to yourself that you can become.**

A Study of Clays Used in Paper Making

By WILFRED V. TORREY
(Assistant Chemist, S. D. Warren Co., Cumberland Mills, Maine)

THIS investigation was undertaken as a preliminary study of some of the physical and colloidal properties of paper-making clays. Until recently clay has been regarded as an inert material by the paper-maker. Clays have been graded chiefly by their color—in some cases determinations of their grit content have been made also. Numerous incidents have ocurred, especially in paper coating, which have led us to believe that clay is far from being an inert substance.

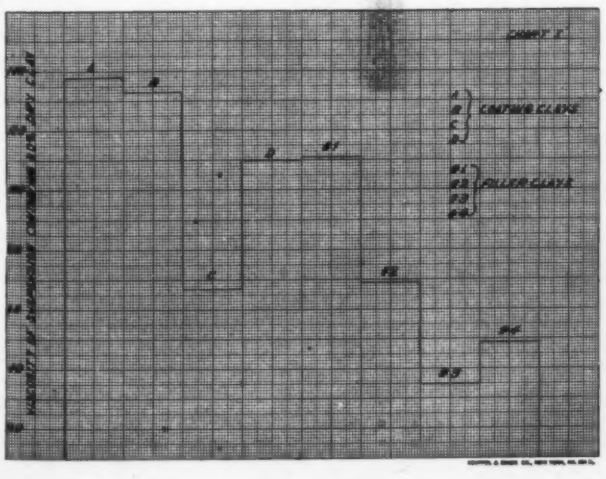
The following tests and observations were made during this investigation:

1—Viscosity of clay-water mixtures.

2—Rate of settling of clay-water mixtures.

3—Effect of reagents on viscosity of clay-water mixtures.

4—Effect of modified clay-slips upon coating mixtures.



Preparation of Samples

The clay samples were dried in an oven at a temperature of about 110° C before being used in these experiments.

Viscosity of Clay-Water Mixtures

Mixtures containing 60 grams of dry clay and 140 c. c. of distilled water were prepared and their viscosities measured with the MacMichael viscometer. The instrument was calibrated for work of this character but the results are comparative only.

The viscosities of eight samples of English china clay (four clays of coating grade and four clays of filler grade) are given in the following table and in Chart 1.

TABLE 1

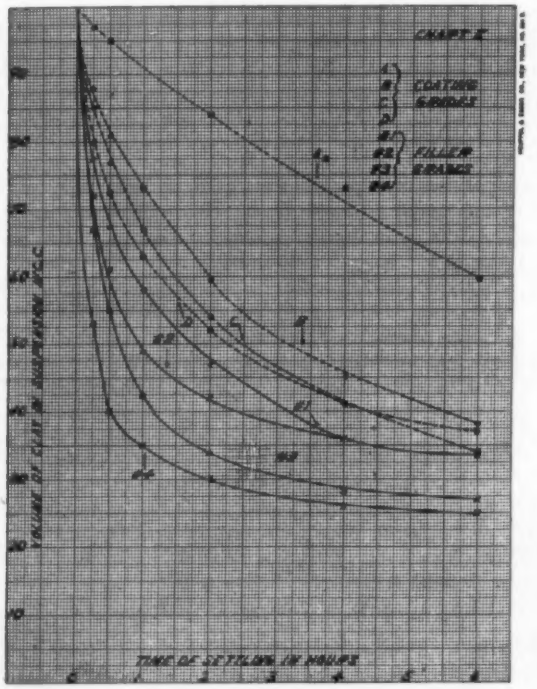
Grade of Clay	Viscosity at 90° F.
Coating	
A	138
B	133
C	67
D	110
Filler	
No. 1	111
No. 2	69
No. 3	35
No. 4	49

Rate of Settling of Clay-Water Mixtures

These experiments were conducted in the following manner: Mixtures of 20 grams of dry clay and 180 c. c. of distilled water were prepared and passed through a 60 mesh screen and a 100 c. c. graduated cylinder was filled to the 100 c. c. mark with the suspension. The graduate was allowed to stand and the volume occupied by the clay beneath the clear liquid was noted at intervals. The results of these experiments are given in Table 2 and in Chart II.

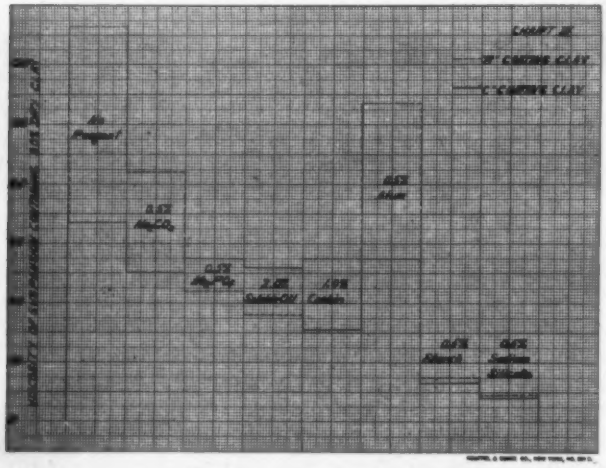
TABLE 2

Total Elapsed Time	Volume of Suspension in c. c. Sample							
	A	B	C	D	No. 1	No. 2	No. 3	No. 4
15 minutes	97	88	85	80	77.5	72	67	53
30 minutes	95	81	77	72.5	67.5	61	55	40
1 hour	91	73	67	63	58	49	42.5	35
2 hours	84	59.5	54	52	47	42	34	30
4 hours	73	45	41	41	36	36	28	26
6 hours	59.5	38	34	37	33.5	..	27	25



Effect of Reagents on Viscosity of Clay-Water Mixtures

In many coating mills the practice is to deliver the clay to the "color" mixing tanks as a heavy "slip" which in some cases contains less than 50 per cent of water. It is obvious that any treatment which would render this thick mass more fluid would make its handling much easier. Up to the time of the present investigation, sodium carbonate was the only modifying reagent used with the clay slips in the plant with which the writer is familiar. Considerable study has been given to this problem and the results obtained have been very promising.



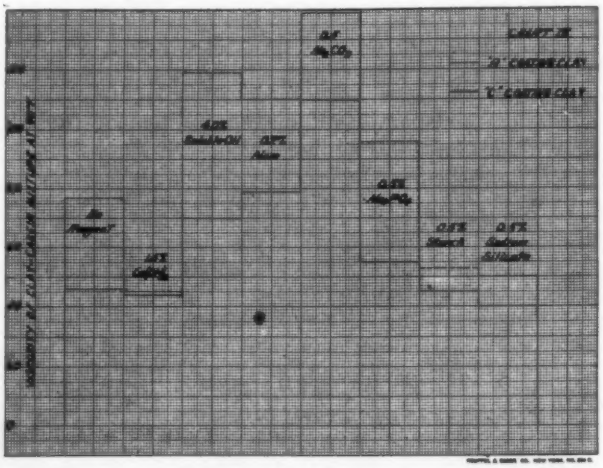
A series of determinations were made to ascertain the possibility of modifying the viscosities of the "clay slips" by the addition of suitable reagents. These trials were made on Coating Clays B and C only as these two grades are used in our coating plant almost exclusively.

The clay-water mixtures were prepared as before (60 grams dry clay 140 c. c. water), the reagents added, screened through a 60 mesh sieve and the viscosities determined. The results of these experiments are given in Table 3 and in Chart III.

TABLE 3

Weight of Reagent		Viscosity at 90° F. B	C
0	0	133	67
0.30 grams	Na_2CO_3	84	50
0.30 grams	N_2PO_4	44	55
1.20 grams	Soluble Oil	36	52
0.60 grams	Casein	55	31
0.30 grams	Alum	107	55
0.30 grams	*Starch	15	13
0.30 grams	Sodium Silicate	9	8

(*Thin Boiling starch "cooked" with borax.)



Effect of Modifying Reagents upon Clay-Casein Mixtures

This portion of the investigation was carried on in the following manner:

100 grams of dry clay, 70 c. c. water and the modifying reagents were mixed. Then an amount of casein in solution with alkaline solvents equivalent to 18 grams dry casein was added. The mixtures were screened and their viscosities determined. The results are given in Table 4 and in Chart IV.

TABLE 4

Weight of Reagent		Viscosity at 90° F. "B" Clay	"C" Clay
None		77	46
1.5 grams	$Ca(OH)_2$*	45	44
4.0 grams	Soluble Oil	119	70
0.2 grams	Alum	110	79
0.5 grams	Na_2CO_3	139	110

0.5 grams	Na_3PO_4	96	55
0.5 grams	Starch	53	45
0.5 grams	Sodium Silicate	50	40
*$Ca(OH)_2$ added dry.			
0.5%	$Ca(OH)_2$	79	70
0.5%	Starch	57	52

Effect of Modifying Reagents upon Coating Mixtures Containing Clay, Satin White and Casein

This series of experiments was conducted as follows:

The clay slips were prepared and the modifying reagents added. The satin white was added in the form of a heavy paste. Finally the casein solution was added and the mixture stirred and screened. The finished coating mixture had approximately the following composition:

Clay Slip = 80 grams dry clay

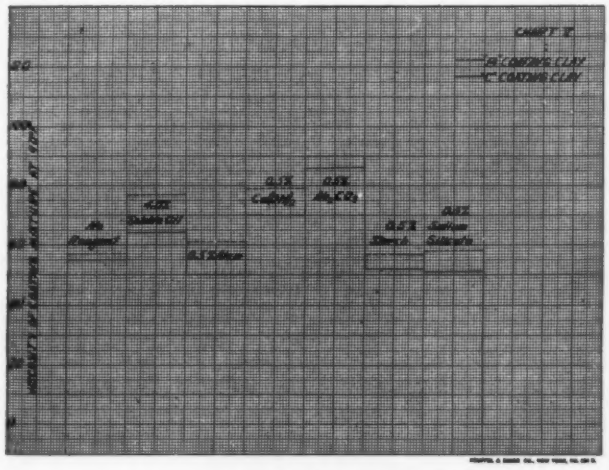
Satin White = 20 grams oven-dry satin white

Casein Solution = 18 grams dry casein

The viscosities of the mixtures thus prepared are given in Table 5 and in Chart V.

TABLE 5

Per Cent Reagent on Weight of Dry Clay	Viscosity at 90° F. "B" Clay	"C" Clay
None	57	55
4.0% Soluble Oil	77	64
0.5% Alum	61	50
0.5% Na_2CO_3	90	86
0.5% Sodium silicate	58	51



Conclusions

1—This investigation has shown the viscosities of water suspensions of different grades of English china clays vary through a considerable range. This fact immediately suggests the desirability of studying the behavior of clays more carefully in grading them, than has been done heretofore.

2—The differences in the rate of settling of the various grades of clay are very marked. The factors which control the settling rates are not definitely known but the following are probably among the most important:

Size of particles.

Ion concentration (pH value).

Presence or absence of soluble salts.

3—There appears to be a connection between the settling rates of clay and the viscosities of the slips. Reference to Charts I and II will show that clays A and B have the highest viscosities and the slowest settling rates, while Clays No. 3 and No. 4 have the lowest viscosities and the most rapid rates of settling. It is noticeable, also, that the clays of coating grade have slower settling rates than the filler grade clays but more work would have to be done in order to prove this to be a general rule.

4—These experiments have shown conclusively that the viscosities of "clay-slips" may be varied through a wide range by the addition of suitable reagents. Suspensions of coating clays B and C were rendered more fluid by the addition of the reagents described in experiments listed in Table 3 and Chart III. In both cases, starch and sodium silicate were by far the most efficient reagents for lowering the viscosities of the clay mixtures; thick, heavy slips were rendered almost unbelievably thin by their use.

5—The viscosities of the clay-casein mixtures are affected materially by the additions of modifying agents to the clay slips before mixing with the casein solutions. The addition of soluble oil, alum, trisodium phosphate and sodium carbonate cause an increase in viscosity while calcium hydrate, starch and sodium silicate have the property of making the mixture slightly more fluid.

6—The changes in viscosity effected by the use of modifying reagents with the clay are less marked when satin white is present than in a mixture containing clay and casein only. The addition of soluble oil, calcium hydrate and sodium carbonate increase the viscosity while the other reagents have very little effect in that respect.

7—Perhaps the most important fact brought out in this investigation is the inefficiency of sodium carbonate as a denocculating agent for "clay-slips." Moreover its use is detrimental when the clay is to be used in coating as the mixtures of clay and casein, or mixtures containing clay, csaein and satin white are rendered much less fluid when sodium carbonate is added to the slip."

8—Either starch or sodium silicate is a very efficient reagent for increasing the fluidity of a heavy clay slip and is a comparatively cheap material to use. These laboratory trials of starch and sodium silicate are borne out in actual mill practice, for clay-water mixtures containing nearly 60 per cent clay are rendered thin enough to be readily pumped through pipe lines.

The writer of this paper has endeavored to show a few of the possibilities for research on clays in these experiments but it should be borne in mind that this is only a preliminary study. It is believed that investigation along the lines described in this article would result in a much better understanding of coating practice than prevails at present.

Budgeting Plant and Equipment Expenditures

By J. J. BERLINER
Accountant and Auditor

TO KEEP the plant and equipment operating efficiently involves a large number of constant expenditures. These expenditures may be classified as follows:

(1) Repairs—These expenditures are necessary to keep the plant and equipment in such condition that it can be operated efficiently.

(2) Replacements—These are expenditures made to replace old equipment that is worn out and discarded. After a certain period of time, equipment reaches the point where it can no longer be operated profitably and must be replaced by new equipment.

(3) Improvements—These are expenditures for new patents and improvements to equipment, lengthening the life of the equipment or increasing the capacity or efficiency of the equipment.

(4) Additions—These are expenditures for new equipment caused by the expansion of the business to take care of the increased volume of business.

To maintain an effective control over expenditures for plant and equipment, the following is necessary:

(1) A proper analysis must be made of the expenditures to determine their classification, and a record must be kept to show correctly their effect on the financial condition of the business.

(2) A proper control must be exercised over the amount of the expenditures sufficient to provide a well-equipped and efficient plant, and at the same time, prevent the expenditure of more than is necessary to secure this result.

How to Record Plant and Equipment Expenditures

Repairs—From the accounting viewpoint, repairs are usually considered as a current expense to be charged against the income of the period in which they occur. However, if for any reason, the cost of repairs fluctuates and it is desired to distribute the repairs evenly, this may be done by estimating the average cost of repairs on the basis of past experience, and future estimations and setting up a reserve for repairs. Under this method, there will be charged to expense and credited to reserve for repairs at the end of each period, an amount equal to the estimated average cost of repairs. As the repairs take place, they are charged to the reserve for repairs. Since the credit to the reserve account is not made until the end of the period, and the repairs are charged to it during that time, the account may show a debit balance during the period, but this balance will be adjusted by the credit entry before the financial statements are compiled.

Replacements—The cost of replacements is not an expense of the period in which the replacement takes place, but of all the periods during which the equipment that is replaced has been used. Thus, if a machine cost $2,000 in 1922, is replaced in 1927 by another machine costing the same, each of the five years should be charged with a part of the cost. If the scrap value of the machine is $200, the five years must be charged with $1,800 ($2,000-$200) or $360 for each year. Since the actual expenditures for any particular equipment take place at one time, and not during each year of its use, it is customary to credit the estimated depreciation to a Reserve for Depreciation account and to debit an expense account for the same amount. When an asset is sold or discarded, it is charged against the reserve account. By this means, the cost of equipment is charged against the income of the periods which benefit from its use

Improvements—When improvements are made, future periods will be benefited either through the increased efficiency of the equipment concerned, or through its longer life, and hence the postponement of replacement costs. In any case, since future periods are to receive the benefit of such improvements, these periods should bear their cost. Hence, improvements are charged to asset accounts, and are not reflected in the expense accounts of the period in which they are incurred.

Additions—As additions, like improvements, are expected to benefit future periods, their cost is not charged to the period in which they are obtained, but is distributed over the periods during which they are used, by means of the periodical depreciation charger. Hence, additions are a capital, and not revenue, charge.

Summarizing the foregoing, plant and equipment expenditures can be divided into two main groups:

(1) Those which are made in order to maintain the present equipment. Repairs and replacements are included in this group. Such expenditures may be termed maintenance costs. They must be included in the periodical expense accounts.

(2) Those which represent an addition to the assets of the business. Improvements and additions are included in this group. Such expenditures are termed plant and equipment cost and are charged to the asset account.

Controlling The Plant and Equipment Expenditures

To exercise effective control over disbursements

for plant and equipment, the following things are necessary:

(1) Data must be available to show results of past operations and serve as the basis of future plans.

(2) After all the available data has been considered, the plans which have been formulated must be expressed in workable form by means of a budget on plant and equipment. Sometimes two budgets are made, on maintenance costs and one on the cost of improvements and additions. The requirements for each are sufficiently similar to make their joint discussion possible.

(3) After the budget is completed, it is necessary to have records and reports prepared which will make possible the control of such expenditures and the enforcement of the budget plans.

The data required to serve as a basis for the control of plant and equipment expenditures may be obtained from the four following sources:

(1) The accounting and statistical records with reference to past experience.

(2) Calculations based on predetermined factors.

(3) The consideration of future plans.

(4) The investigation and study of experts.

To control expenditures for plant and equipment, it is necessary to make first, a proper classification of the plant and equipment and secondly an accurate estimate of plant and equipment expenditures. In a manufacturing business, for instance, plant and equipment expenditures will vary with the production program. If the production program is to be increased, it will be necessary to do one or both of two things: (1) Secure additional equipment; (2) Use present equipment more extensively. In either case, additional expenditures will be incurred and the amount of their production capacity can be estimated. For past production capacity to be obtained accurately, a record of each unit of equipment is necessary.

If the present equipment is to be used more intensively, this will increase the maintenance cost, and an estimate of this increase must be made. It should be obvious that a change in the production program may not affect all the equipment of the business to the same extent. For instance, it may be planned to increase the output of only one department; and if the previous maintenance expense of this department is shown separately from that of other departments, a more accurate estimate of the increase can be made. It will be necessary, however, to know more than the total cost of the maintenance of the department. The new program will probably affect some units of equipment in the department more than it will others. It is desirable, therefore, to have records which will show each unit of equipment in the department, and the maintenance expense incurred on it. This is accomplished by keeping a plant ledger.

A plant ledger is a record which contains an account with each unit of plant and equipment. It serves as a subsidiary record to the controlling account or accounts with plant and equipment kept on the main ledger. The plant ledger is usually kept on cards or loose-leaf sheets, each card or sheet providing a record of one unit of equipment. The size of this unit will depend on conditions. There may be a separate account for each machine, or, if several machines of the same pattern and size are purchased at the same time, they may all be recorded in one account. Each account in the plant ledger, however, should show at least four things:

(1) The original cost of equipment and the date of purchase.

(2) The amount of depreciation accrued on the equipment to date.

(3) The amount of repairs made on it to date.

(4) Its present book value.

The repairs entered on the plant ledger account do not affect the value of the equipment since they are treated as an expense and are never added to the asset. It is, however, useful to have them entered on the plant ledger account for memorandum purposes so that in making future estimates, it is possible to obtain information of the past cost of repairs, not only in total, but also by departments and by units.

As equipment wears out, its replacement must be provided for. This provision is accomplished by charging a certain amount to the expenses of each budget period and crediting a like amount to a reserve for depreciation. In the calculations of the depreciation charge, three things are considered: The original cost of the asset, its anticipated life, and its estimated scrap value. By subtracting the scrap value of the asset from its original cost, it is possible to determine the cost of the use of the asset during its period of life. This cost is usually distributed over the period of its life in such a way that each budget is charged with its equitable share.

After the maintenance costs of past periods, as shown by the accounting and statistical records, have been obtained, it is necessary to determine the effect of future plans on these costs. If, for instance, a large increase in production is planned, the increased cost of maintenance arising from this increased production must be estimated. If new methods of manufacture are to be employed, the resulting change in maintenance cost must be calculated. If new equipment is to take the place of old, the maintenance cost will be affected. If it is planned to keep the equipment in better repair so as to make it more efficient and to prolong its life, this change must be considered. These, as well as other factors, affect the cost of maintenance and all must be considered.

In considering the relation of maintenance cost

to future plans, various comparisons should be made. Some items of maintenance cost will vary in proportion to production volume. To estimate these, it is necessary to determine the rates of the volume of production to these costs during the period. By applying this ratio to the estimated volume of production for the current period, an estimate for the period can be obtained. Some items of maintenance cost will vary more nearly with the floor space used than with the production volume. Therefore, the ratio of floor space used in the past period to these items of maintenance expense during the same periods will be obtained, and the ratio applied to the estimated floor space of the current period. Other items of maintenance costs may vary in proportion to the number of units of equipment used and their amount will be correspondingly increased.

It is desirable that a periodical inventory or appraisal be made of plant and equipment and used as a means of checking the plant ledger and as a basis for budgetary plans. By this means, inaccuracies in depreciation estimates and inadequate repairs can be discovered and corrected. It is also possible that too liberal depreciation may be allowed or too extensive repairs made, and such an appraisal will disclose this fact. Such an appraisal will also show when it is better to purchase a new machine, rather than repair the old one.

Many manufacturing concerns have on their staffs a plant engineer, who is responsible for the production, use and maintenance of plant and equipment. The engineer should be responsible for:

(1) The study of improved methods of factory construction.

(2) The study of present factory layouts and presentation for the approval of the executive in charge of production of proposals for improvements based on costs involved and savings made.

(3) The study of machinery, equipment and tools, and the presentation for the approval of the executive in charge of production of proposals for changes based on costs involved and savings made.

(4) The preparation of a periodical plant and equipment program based on studies made in collaboration with the works planning and engineering departments.

(5) The presentation of the plant and equipment program to the executive in charge of production for approval and transmissions to the central executive committee of the company.

(6) The preparation of a periodical maintenance plan as proposed by the works maintenance departments and detailed by the works engineering departments.

(7) The presentation of the maintenance program to the executive in charge of production for approval and transmission to the central executive committee of the company.

(8) The supervision over the execution of the plant and equipment and the maintenance programs as approved by the central executive committee of the company.

Formulating the Budgetary Plan

Formulating the budgetary plan involves a consideration of (1) the contents of the plant and equipment budget; (2) the responsibility for its preparation; (3) the form in which made; (4) manner in which used.

The plant and equipment budget should state the following: (1) the anticipated repairs and estimated depreciation on the present plant and equipment; (2) the estimated cost of new equipment which should show: (a) cost of factory equipment, and (b) cost of equipment for administrative and selling units of the business; (c) anticipated repairs and estimated depreciation on new equipment.

PLANT AND EQUIPMENT BUDGET

Group	Old Equipment			New Equipment				Total Depreciation	Total Repairs	Value of Total Equipment at End of Period
	Amount at Beginning of Period	Estimated Depreciation	Estimated Repairs	New Equipment Required	When Needed	Estimated Depreciation	Estimated Repairs			
	2	3	4	5	6	7	8	9	10	11

Form 1

The executive in charge of production is responsible for the preparation of the plant and equipment budget so far as it relates to the factory. This responsibility he will delegate to the plant engineer who in turn will employ the assistance of the works maintenance department and the works engineering department. In calculating the depreciation charges, they may avail themselves of the services of the accounting department as well.

No standard form for the plant equipment budget can be presented. Form 1 shows what information it should contain. In filling in columns 4 and 8, the plant engineer will consult the works engineering department for information with reference to the cost of repairs. The works maintenance department will supply information with reference to the amount of repairs to be made. If the company produces its equipment, the works engineering department will supply the data needed for column 5. If the new equipment is to be purchased from outside vendors, the purchasing agent will supply this data. Column 6 on the Plant and Equipment Budget states when new equipment is desired. With this as a basis, the purchasing agent will state the terms, on which the equipment will be purchased and show

the date of payment. This information is necessary for the preparation of the financial budget. If the equipment is to be produced by the company, an estimate must be made of the disbursements necessary for its production. The date given in column 6 is the date when the completed equipment is desired.

The budget for plant and equipment consists of an estimate of the expenditures necessary for maintaining the present equipment and the securing and maintenance of the additional equipment demanded by the budget program. After such a budget has been prepared, it must be approved by executive authority.

Its approval consists in the making of various appropriations for the necessary amount to cover

MONTHLY REPORT ON APPROPRIATION

NAME OF APPROPRIATION	NO.	PERIOD	PER CENT OF COMPLETION	ORIGINAL AMOUNT	ADDITIONS	DEDUCTIONS	FINAL AMOUNT	CASH DISBURSED	ACCOUNTS PAYABLE	ENCUMBERED BALANCE	CONTRACT FOR LABOR & SUPPLIES	BALANCE AVAILABLE FOR FUTURE CONTRACTS
	2	3	4	5	6	7	8	9	10	11	12	13

Form 2

the cost of the various items included therein. After these appropriations are made, it is customary to delegate to some official of the concern the authority to grant expenditures under each appropriation. That this executive may exercise effective control over such disbursements, it is necessary that they be made only on requisition or request. When repairs or additions to plant or equipment are desired by any department, the head of this department should submit a requisition to the executive to whom the responsibility for exercising such control over disbursements has been delegated. Such requests should be accompanied by an estimate of the cost of repairs or additions. If equipment is to be purchased from outside vendors, it is easy to obtain the purchase cost and submit it with the requisition. If additions to plant or equipment are to be constructed by the company, an estimate of the cost of the construction must be made.

The estimate of the cost of repairs or construction can be made in two ways. If the business maintains an engineering department, this department can be asked to make the estimate. If it is not possible or not desirable to have engineers make the estimate, it can be made by the cost accounting department on the basis of statistics obtained from the records showing previous costs. If co-operation between the accounting department and the engineering department is secured, more accurate estimates will be obtained.

If the requisition calls for the construction of equipment by the factory, careful records should be kept of the cost of the construction. The method of determining these costs is very similar to the method of determining the cost of goods manufactured for sale. Each requisition, after it has been approved, is given a number, and a construction order is issued authorizing the job. The construction order has the same number as the requisition. An account is opened on the cost records and all costs incurred in the construction are charged to this account. When the construction order is completed, a report is made to the executive who supervises the expenditures for construction showing the estimated cost and the actual cost. If there is any considerable variance, it is due to inaccurate estimates or an excessive cost.

With the comparative figures available, it is possible to determine the cause of variation. Unless such comparisons are made, it is impossible to exercise any effective control over the cost of construction work. Every attempt should be made to obtain accurate costs in connection with construction and repair orders. Unless such costs are accurate it is impossible to judge the efficiency with which the work is done or to estimate accurately the cost of future work.

It is usually not possible to estimate exactly each item of plant and equipment cost which must be met during the budget period. Such expenditure cannot always be foreseen. It is desirable to anticipate these additional costs by including an item in the plant and equipment budget to cover them. Since these additional costs vary from period to period, it is well to credit a reserve account for the amount included in each budget to provide for them. When the costs are incurred, they can be charged against the reserve. These additional costs may be due to rising costs of material and equipment, labor troubles, accidents, increased production, etc. By employing the method outlined above, they can be taken care of as they arise. It is obvious that this reserve has a limited use and must not be used as a means of hiding excessive amounts paid for construction or repairs during certain periods. If this reserve is too large, it prevents proper control.

To exercise effective control over the plant and equipment budget, it is necessary to have periodical reports which will make possible a comparison between the amount appropriated for each class of expenditures and the actual amount expended. A report should be made monthly giving the comparison as shown in Form 2.

The report is of service not only to the executive who has control of the purchases and construc-

tion of plant and equipment but also to the financial executive. The report shows the former the amount available for future purchases or construction, and it shows the latter the amount which he must plan to finance. The tenth column gives the treasurer information of special value since it states the payments to be made in the near future. Column 13 shows the amount which may be diverted to some other purpose in case of financial stringency. If the executive committee receives this report each month, it can exercise an effective control over all disbursements.

Summary

The following is a brief summary of procedure for budget control of plant and equipment:

(1) Requirements for control of plant and equipment.

(1) A proper analysis of plant and equipment expenditures to determine their classification and a record of them which will show correctly their effect on the financial condition of the business.

(2) A proper control of the amount expended for plant and equipment to the end that sufficient will be expended to provide a well equipped and efficient plant, and, at the same time, prevent the expenditure of more than is necessary to secure this result.

(2) Control of the amount of expenditures required.

(1) That data be available which will show results of past operations and serve as a basis of future plans.

(2) That plans be formulated with basis of this data and be expressed in workable form by means of a plant and equipment budget.

(3) That records be maintained and reports made which make possible the enforcement of the budget formulated.

(3) Data required as basis of control.

(1) That which is obtained from the accounting and statistical records with reference to past experience.

(2) That which is obtained by mathematical calculations based on predetermined factors.

(3) That which is determined by a consideration of future plans.

(4) That which is obtained as a result of the investigation and study of experts.

(4) Plant and equipment budget shows.

(1) The anticipated repairs and estimated depreciation on the present plant and equipment.

(2) The estimated cost of new equipment including (a) cost of factory equipment, and (b) cost of equipment for administrative and selling units.

(3) The anticipated repairs and estimated depreciation on the new equipment to be secured.

(5) Records and reports for control of plant and equipment budget include:

(1) Requisitions for all purchases of equipment and for all construction of equipment or repairs.

(2) Estimates of cost of purchases or construction which accompany the requisition.

(3) Records of the cost of all construction or repair work performed by the concern.

(4) Reports showing a comparison of estimates and costs.

(5) Reports showing a comparison of expenditures with budget allotments.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

High Pressure Turbines

THE paper manufacturing industry, according to a recent article in **Power**, has installed a greater percentage of high-pressure turbines than any other industry.

In their report they give the names of 27 recent high-pressure turbine installations. Ten of these are in the paper industry alone, or a total of 37 per cent. Next comes the oil refining industry with less than 15 per cent. All of which is an excellent indication of the up-to-dateness of paper manufacturers.

In the paper industry, the turbine capacity varies from 300 kilowatts to 5,000 kilowatts. The largest installation was made by the Paul A. Sorg Company, Middletown, Ohio, who put in two 500 kw. turbines. Steam pressures vary from 200 to 425 lb. per sq. in. Wherever condensers are installed, bleeder steam is used, the pressure of the bleeder steam varying from 10 to 150 lb. per sq. in. The maximum temperature is 692 degrees.

Chimney Capacity and CO_2

ENGINEERS seldom give thought to the fact that by increasing the CO_2 content of chimney gases to where they belong, the capacity of the chimney is materially increased.

As a result, it is evident that instead of building a new chimney, the correct solution is to install a CO_2 recorder and rectify the CO_2 content. Thus the purchase of a CO_2 recorder may be the means of not only saving the cost of a new chimney but it usually reduces fuel costs materially and soon pays for itself. I do not know of any CO_2 recorder that costs nearly as much as an average new chimney.

It is easy to explain why this is true: when the CO_2 content is high the volume of flue gas is rela-

tively small. Naturally, a chimney of given size is better able to take care of a small volume of gas than a large volume. For example, with 12 per cent of CO_2, the volume of flue gas is only about one-half as great per pound of fuel as when the CO_2 is 6 per cent.

When the CO_2 content is at the theoretical 21 per cent, the total volume of gas is as small as can be made and the smallest possible chimney will take care of the load. But as an extreme in the other direction, excess air sometimes runs as high as 600 per cent. Isn't it plain that when excess air is 600 per cent, a chimney several times larger will be needed than where the CO_2 is "just right"? Recorders certainly are worth while.

Efficiency of Auxiliaries

WHERE there is too much exhaust steam—so much that some exhaust is wasted—it is usually best practice to run auxiliaries electrically or mechanically rather than by steam.

But where there is insufficient exhaust for heating or processing it is usually best to operate the auxiliaries by steam rather than to use bleeder steam for heating or processing systems.

We frequently hear the excuse where steam operated auxiliaries are used that the exhaust is used for heating the feed water anyway, hence there is no loss. But when the main engine is exhausting steam to the atmosphere while that from the pump is being utilized, the loss is obviously as great as where the exhaust from the main engine is used for heating water and the steam from the auxiliaries is being wasted. Probably it is greater.

To be certain that the paper mill power plant is efficient throughout, every process must be considered. It is impossible to lay down a hard and fast rule applicable to every paper mill power plant. The thing that the paper mill owner is most interested in is maximum production per dollar invested rather than maximum efficiency.

Keeping Steam Clean

A LARGE Canadian concern having six 600 h. p. boilers could not maintain a superheat of more than 50 to 60 degrees F. over any reasonable period of time. They installed a modern steam purifier. They state that they are now obtaining a steady average superheat temperature of around 100 degrees which is the theoretical temperature they should have obtained with dry steam from the boilers to the superheater.

Before the steam purifiers were installed, they could not carry over one and one-half gauges of water in their boilers because of tremendous foaming and priming difficulties. Since the installation of purifiers they have run their boilers constantly with water level approximately at middle gauge. But even at full gauge they don't get any drop in the superheat.

Before the purifiers were installed, they had to dismantle and clean the turbines every six months. Now, inspection shows them to be perfectly clean.

When first putting this plant in operation, they did not have a water softening plant. In order to try to correct the above troubles, they installed an intermittent system. This feed water treatment system takes care of the scale forming material so that they have no further trouble with scale in their boilers. But it did not, in any way, decrease priming and foaming troubles. All of which teaches a valuable lesson on the importance of clean steam.

Avoid Winter Troubles Now

NOW is the time to prepare for the winter months. if there is any maintenance work to be performed on your heating system, today is the time to do it—when the load is slow or when there is no load at all.

Most boilers can now be carefully cleaned and inspected. Pumps should be put in first-class condition. Leaks should be stopped. Fix up your traps, your packing, and your valves. Stokers and grates should be replaced or mended wherever mending is necessary. Mend your roofs and your water spouts. Wield the paint brush where needed. Look over and improve your insulation. And so forth. By doing these important jobs now, greater efficiency and economy will result during the winter months, and it is easier to do them now than later on when the equipment is needed. Avoid winter troubles **Now.**

Clean Boilers Pay

I ALWAYS like to see figures in dollars and cents on the economy of keeping boilers clean.

For example, I have before me a report on a mill having boiler repairs running to about $4,500 per year. They installed modern water treating apparatus and after five months' use they reported that the total saving due to the apparatus was $8,670 on a 5 months' run, or an annual saving of $20,880. This apparatus also saved the old boilers from being condemned by the boiler inspector. The water contains 99.6 grains of scale-forming substances per gallon.

Another concern using very unclean water sent in the following report:

> "We have saved between $4,000 and $6,000 in water cost alone, besides the benefits which we have procured in the way of decreasing boiler cleaning costs and better operation of boilers."

Tube cleaners, soot blowers, water softeners, deconcentrators—all such equipment for keeping boilers clean is usually highly profitable.

Editorial Comment

By WILLIAM SIBLEY

Arbitrate—Don't Litigate

THE American Arbitration Society is steadily increasing its scope of activity and rapidly growing in popularity among manufacturers who have commercial disputes to settle. During the past two years, in a single industry it is stated, more than 19,000 cases involving in excess of $4,000,000, have been arbitrated and thus kept out of the courts.

There are a number of very good reasons why arbitration is better for the manufacturer than litigation. In the first place lawsuits nearly always react detrimentally on commercial goodwill, while arbitration preserves intact that asset. This is because litigation is public whereas arbitration is private.

Our court dockets have become so congested with cases that years may elapse before a case entered today can even be heard. Arbitration proceedings are immediate, direct, and speedy. Futhermore, arbitration is flexible, while court procedure is, of necessity, very rigid.

In litigation, it is necessary to educate judges and juries, if not the lawyers themselves, in the matter of individual and frequently highly technical trade practices. All such educational effort is dispensed with in arbitration, since the arbitrators are usually experts in the business in which the dispute arises. If for no other reason than these, it must be evident that arbitration would prove much less expensive—and equally, if not more satisfactory.

Mistakes

THE man who says he never made a mistake is either a liar or a loafer. Human nature is fundamentally imperfect and because of this fact mistakes are made wherever human nature is employed. In every business, be it that of manufacturing calico dresses, selling ice cream cones, keeping books, or writing two-for-a-nickel editorials, errors of various kinds are constantly being made. Nor does recognition of the fact that "to err is human" obviate the necessity for enduring the concomitants of error.

Mistakes are expensive. They waste time; not only that amount involved in their perpetration but also that amount necessary for their correction after discovery, both of which expenditures would be saved had the mistake not been made. Errors cost customers, money, time, material, men, or jobs, depending upon the nature of the business and the tolerance of the one on whom the brunt of the error falls. In any event the sequents of error are inescapable.

Almost no price is too high to pay for increased accuracy. Today's tendency in every line is for accelerated speed. Speed is profitable, if coupled with accuracy but it is a nihilist if married to inaccuracy. This simple fact should mean much to American manufacturers, since it should cause them to consider error elimination before endeavoring to increase production. Too often, production engineering takes precedence over efficiency engineering.

We frequently hear people damning this age as the "jazz age," "crime age," "age of reform," or some other kind of an age. After all, this is the only age we have—and we might better settle down to that fact and make the best of it.

Invoicing Industrial Relations

WE ARE all thoroughly familiar with methods of inventory. It is a matter that comes to our attention at least once each year and during that period, frequently with some force. But while we know how and are accustomed to counting articles in a bin it would seem strange if not impossible to apply the inventory to industrial relations—to appraise the morale and relationships of payroll members with the same certainty that we now appraise the value of physical property.

Yet such is being done—with considerable profit. Stock-taking in the man-management field is growing in universality. As the Metropolitan Company has put it: "Although the attitude of the working force would seem to be an intangible thing, any experienced executive can go into an establishment and soon tell just what the outstanding facts about the relationships are. The place where the spirit of confidence prevails does not give the same impression as one where confidence is absent.

"And the production and spoilage records tie up closely with the presence or absence of an attitude of mutuality."

The Rotary International of Chicago has been actively interested in summing up some fundamental principles of industrial relations, and this, it seems to us, is an intelligent step forward in supplying a basis for measurement—of applying concrete, practical thinking to the human element in organization. According to one statement "employees should feel that they belong to the business; that each part of their work helps to run that machine or the entire organization."

As a means to this end, the Pennsylvania Railroad system suggests six principles which are considered

—— on Timely Subjects

the "essentials of right for the other fellow." These are: 1—Steady employment; 2—A good wage; 3—Time for recreation; 4—Opportunity to elevate one's self; 5—A voice in determining rules and regulations under which one shall work; 6—A fair division of the profits after a reasonable wage has been earned and a sufficient amount of paid capital to attract it to an expanding business."

Such is the yardstick with this railroad when they attempt to determine the status and value of employee relations. All these help re-inforce the inventory idea. Their regular application to the plans and relationship in process tell a valuable story. It pays to take stock of human relations in any business.

Radio in Modern Business

MORE and more is recognition being given to radio as a means for the acceleration of ordinary, every-day business. For a number of years the Canadian National Railways, and one or two other large corporations have used radio as a means for the speedy transmission of private orders and instructions, while for the past two years at least one railroad in the U. S. has used radio for the control of remote signals and switches. Now, however, we find progressive companies transmitting reports, price lists, and receiving orders via radio. The Phillips Petroleum Company, with headquarters in Oklahoma and branch offices and producing wells throughout Texas, find radio a cheap and reliable means of communication for their immediate district.

The development of the beam radio makes this possible. While beam broadcasting is as yet imperfect from a commercial standpoint, it has been sufficiently well developed to permit the successful guidance of the trans-Pacific flight to Hawaii. Several of the larger companies of the country are now investigating the beam radio as a means for accelerating their business.

Beam radio is merely the transmission of radio waves in a direct line, rather than in the usual 360 degree circle. This means the shooting of ether waves in a single direction instead of broadcasting them in every direction. And it means for the paper mill with distant logging camps, a manufacturer with numerous branch offices over the country, or a contractor with several construction jobs under way at one time, that there is available a means for instantaneous message transmission in semi-private fashion.

With the development of such far-reaching improvements as we now witness on every side, it is becoming more and more apparent to everyone that vision, foresight, and prompt action are at a premium.

Checking Tools in and Out

ANY system that successfully checks tools in and out of the tool crib or stock room must accomplish four things, viz:

a—Safeguard the tool loaner.

b—Safeguard the tool borrower.

c—Make possible efficient handling of tools.

d—Provide a record that will enable tracing and history of tool performance.

The usual single check system safeguards the loaner providing the system is honestly administered. Double check systems contribute to mistakes and costly losses due to their complication. What is needed by the average plant is a simple system that will work without provisos. Such a system has been devised by Gillett S. Schaller of the University of Washington, which we pass along to you for consideration, necessary revision and possible adoption.

"Insist at all time on a written tool requisition. Should the loaner be required to sign a tool requisition it is certain he will be very careful about his records, while the effect on the borrower's required signature to the same requisition is favorable since, because of it, he will be very certain about the kind and size of tools he asks for—which automatically eliminates discussion at the tool crib as the tools are checked out as compared with those returned. The loaner then has a receipt and the borrower feels himself doubly responsible for their safe and immediate return. It is sometimes well to have the borrower's time clock number affixed with his signature, —a requirement which not only has a moral effect on the borrower but enables rapid tracing of overdue tools."

This little system is simplicity itself, but in addition to that favorable feature it greatly aids the inventory of the tool crib, erases the buying of excess or needless tools, and either overstock or under supply. The running inventory which this little system provides also shows the condition of all tools at all times. This must necessarily be correct because in addition to the brass check at each bin, there is a written receipt available in the tool crib to verify the location of the check and that receipt contains the signature of the borrower. Further, there can be no question of any alteration of the original requisition because a carbon copy duplicate will be found in the tool crib which cannot be altered without detection.

Efficient tool crib operation can save any plant a great deal of money, time, and expense.

The Paper Industry Annual Safety Contest

39 Mills "Toe the Mark" in July Scores

PERFECT SCORES

	PARTICIPANT	NAME OF MILL	LOCATION
Group A	International Paper Co.	Otis	Chisholm, Me.
	Kimberly-Clark Co.	Niagara	Neenah, Wis.
Group B	American Writing Paper Co.	Beebe & Holbrooke	Holyoke Mass.
	International Paper Co.	Fort Edward, No. 2	Fort Edward, N. Y.
	Rhinelander Paper Co.	Rhinelander	Rhinelander, Wis.
	Strathmore Paper Co.	Mittineague, No. 1	Woronoco, Mass.
Group C	American Writing Paper Co.	Dickinson	Holyoke, Mass.
	American Writing Paper Co.	Gill	Holyoke, Mass.
	American Writing Paper Co.	Holyoke	Holyoke, Mass.
	American Writing Paper Co.	Linden	Holyoke, Mass.
	American Writing Paper Co.	Norman	Holyoke, Mass.
	American Writing Paper Co.	Parsons	Holyoke, Mass.
	American Writing Paper Co.	Riverside	Holyoke, Mass.
	American Writing Paper Co.	Wauregan	Holyoke, Mass.
	Berestrom Paper Co.	Neenah	Neenah, Wis.
	Bird & Son, Inc.	Phillipsdale	East Walpole, Mass.
	Defiance Paper Co.	No. 3	Niagara Falls, N. Y.
	The Gardner & Harvey Co.	No. 1	Middletown, Ohio
	The Gardner & Harvey Co.	No. 3	Middletown, Ohio
	International Paper Co.	Livermore	Chisholm, Me.
	International Paper Co.	Riley	Chisholm, Me.
	International Paper Co.	Webster, No. 9	Orono, Me.
	International Paper Co.	Winnipiseogee	Franklin, N. H.
	Kimberly-Clark Co.	Atlas	Neenah, Wis.
	Kimberly-Clark Co.	Badger-Globe	Neenah, Wis.
	Kimberly-Clark Co.	Neenah	Neenah, Wis.
	Lincoln Pulp & Paper Co., Ltd.	Lincoln	Merritton, Ont., Can.
	Lincoln Pulp & Paper Co., Ltd.	Lybster	Merritton, Ont., Can.
	Lincoln Pulp & Paper Co., Ltd.	Sulphite	Merritton, Ont., Can.
	Sorg-Oglesby-Smith Paper Co's.	Smith	Middletown, Ohio
	Strathmore Paper Co.	Mittineague, No. 2	Woronoco, Mass.
	Strathmore Paper Co.	Woronoco, No. 1	Woronoco, Mass.
	Thilmany Pulp & Paper Co.	Appleton	Kaukauna, Wis.
	Union Bag & Paper Corp.	Allen	New York, N. Y.
	Union Bag & Paper Corp.	Fenimore, Sulphite	New York, N. Y.
	The Upson Co.	Board Mill	Lockport, N. Y.
	U. S. Gypsum Co.	Gypsum	Chicago, Ill.
	U. S. Gypsum Co.	Lancaster	Chicago, Ill.
	U. S. Gypsum Co.	Oakfield	Oakfield, N. Y.

IMPERFECT SCORES

GROUP A			GROUP B			GROUP C		
Key	Rank	Rate	Key	Rank	Rate	Key	Rank	Rate
A-22	3	.01	B-17	5	.02	C-42	34	.07
A-26	4	.04	B-20	6	.03	C- 2	35	.08
A-17	5	.05	B-10	7	.05	C-21	36	.19
A-13	6	.08	B- 9	8	.08	C-57	37	.20
A- 5	7	.10	B-15	9	.10	C-25	38	.21
A-20	8	.12	B-31	10	.19	C-53	39	.25
A-25	9	.13	B-36	11	.19	C-26	40	.45
A-12	10	.14	B- 1	12	.20	C-50	41	.45
A- 7	11	.15	B-25	13	.22	C-30	42	.47
A- 4	12	.23	B-33	14	.23	C-41	43	.61
A-15	13	.23	B-30	15	.24	C- 8	44	.61
A- 2	14	.29	B- 8	16	.25	C-45	45	.62
A-24	15	.29	B-29	17	.26	C-48	46	.81
A-11	16	.49	B-12	18	.28	C-24	47	.87
A-10	17	.49	B-35	19	.37	C-16	48	.96
A- 8	18	.55	B-19	20	.38	C-22	49	1.03
A- 1	19	.57	B- 7	21	.40	C-13	50	1.44
A- 3	20	.60	B- 5	22	.52	C- 7	51	2.79
A-23	21	1.01	B-11	23	.54	C-15	52	4.85
			B- 4	24	.68			
			B-13	25	.72			
			B-23	26	.79			
			B-24	27	.98			
			B- 6	28	1.53			
			B-34	29	1.80			
			B- 2	30	3.20			

NASACO LOG

Program of the Paper and Pulp Section

of the Sixteenth Annual Safety Congress, to be held at the Hotel Stevens, Chicago, September 26-30, 1927

Chairman, W. J. Peacock, Head, Department of Personnel, Northern Paper Mills, Green Bay, Wis.

Vice-Chairman, M. G. Hoyman, Superintendent, Kimberly-Clark Company, Neenah, Wis.

Secretary, Ameil Umberham, Fort Howard Paper Company, Green Bay, Wis.

Tuesday Morning

September 27, at 9:30 o'clock

Private Dining Room No. 2, Third Floor

1. Reports of Officers and Committees.
2. Accident Analyses and Costs.
   Alvin F. Record, International Paper Co., Chisholm, Me.
3. Plant Inspection and Safety Committees.
   B. D. Rogers, Manager, Labor Bureau, Bird & Son, E. Walpole, Mass.
4. Standard Guarding and the Code.
   C. K. Boyer, Interlake Pulp & Paper Co., Appleton, Wis.

Wednesday Morning

September 28, at 9:30 o'clock

Private Dining Room No. 2, Third Floor

Presiding Officer, M. G. Hoyman, Kimberly-Clark Company, Neenah, Wis.

1. Election of Officers.
2. Symposium: Selling Safety in Paper Mills
   To Employees—R. S. Turner, West Virginia Pulp and Paper Co., Mechanicsville, N. Y.
   To Foremen—W. E. Walker, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
   To Superintendents—J. H. Slater, Escanaba Paper Co., Escanaba, Mich.
3. The Lessons of Experience.
   John Lundrigan, Industrial Superintendent, International Paper Co., New York City.

Wednesday Luncheon

September 28, at 12:30 o'clock

Private Dining Room No. 2, Third Floor

1. Presentation of Minor Cups Awarded by the National Safety Council.
   C. E. Pettibone, Vice-President for Industrial Safety, National Safety Council.
2. Presentation of Grand Cup Awarded by "The Paper Industry," Edward B. Fritz, Publisher.
   A. Scott Dowd, Editor, "The Paper Industry," Chicago, Ill.
3. Why Safety Is Worth While.
   D. C. Everest, President, American Paper and Pulp Association, New York City.

TELLING SCORES

	January	February	March	April	May	June	July
No. of Mills	119	116	115	114	113	111	103
Total Hours Worked	8,363,734	7,876,213	8,573,278	8,707,808	8,292,249	8,398,894	6,761,772
No. of Accidents							
Death	1	4	2	2	1	1	0
Perm. Disability	1	2	6	2	2	5	5
Temp. Disability	332	274	274	246	216	261	206
Totals	334	280	282	250	219	267	211
No. of Days Lost							
Death	1000	4000	2000	2000	1000	1000	0
Perm. Disability	300	350	590	250	100	1025	350
Temp. Disability	3417	3204	3635	2520	2518	2579	1769
Totals	4717	7554	6225	4770	3618	4 04	2119
Frequency Rate	39.95	35.56	32.89	28.72	26.14	31.80	31.21
Severity Rate	.56	.96	.73	.55	.44	.55	.31

Economic Conditions in Paper Industry

Study of Waste Offered as Prime Need in Statement by Hanway

THE state of business appears today to be judged largely by the amount of profit rather than by the actual volume attained, but it is possible for many companies to be enjoying what normally would be termed satisfactory business and still report little or no earnings.

Unquestionably, the paper industry has operated above its normal during many months in 1927, save, perhaps, in a few special grades of paper. And yet it is sometimes declared that this type of business is prosperity without profit.

It would seem that a careful analysis of the situation might well be made in order to determine a possible solution of the profit problem. An unprejudiced study of the situation might bring out a likely solution of the subject.

Beginning with business in the industry at present we find that it is operating at over 80 per cent capacity, which is relatively high summer activity. In addition, the production capacities during the past two years have increased more rapidly than in preceding years, while total importations have at the same time been increasing. It is apparent then that competition from new capacity and imports is greater and still the industry operates above normal. This would seem to relieve actual market conditions of some of the blame and suggest that we look elsewhere for light on the subject.

If all the mills, large and small, were now operating without profit it might well be said that either the price or the market or both were the cause. But all mills are not operating unprofitably—in fact, some of the mills do very well at 80 per cent of capacity. If the price structure is in some cases spotty and inclined to weakness it has, on the whole, been in line with price changes in other key industries. It is seemingly impossible to attribute conditions to any one cause. The problem, primarily, is one of management and a solution that would serve one company probably would not settle the profit situation for another company.

This would suggest a study of results obtained by successful companies and the use of some of the profitable methods employed by them.

The records of the past few years indicate that while the tendency of wholesale paper prices has been distinctly downward, the trend of prices of certain raw materials consumed by the paper industry has not been at all parallel. This constitutes one direct source of shrinkage of income as compared with previous years, a remedy for which has been found by some manufacturers in increasing the output per worker. Naturally, this increased output per worker also contributes to balance the increase in wages.

Increased efficiency, new inventions, new machines, and elimination of waste have all contributed to effect increased production at lower costs. Companies that are most successful along efficiency lines of the kind indicated should show and usually do show the best earnings per unit sold.

But increased production per worker and other savings have brought about another situation which has been overlooked by many concerns. The increase in production meant new sales schedules, additional sales and advertising expenses, and in many cases the addition of many new and special lines, each of which had to be developed separately and at considerable expense. Many of these lines were not of a standard variety and as a result there was a general increase in overhead. The keeping of records for a multiplicity of smaller items meant extra clerical help, as well as greater space requirements, etc. The handling meant more cost, while new tools, shorter runs, heavier delivery costs, etc., all ran up the bill which helped to eat up the savings effected by an increased production per wage earner. Distribution costs have increased perceptibly during the past few years, this being true of practically every industry.

Research, or, as it has been called, "organized forethought," into distribution as well as production seems to be one dependable safety valve.

If profits are not commensurate with the business obtained, it might pay some companies to do less business, and by concentrating on a few lines, increase the returns so that a smaller volume would mean larger returns. Naturally, the question of obtaining profit is the objective and if new lines build profits, this would not apply. But it is easential to know if new lines do add profit.

It might pay others to make a thorough analysis of the costs and results of the work of each salesman, and of the costs per unit of obtaining business in each territory to determine where and how savings may be effected.

The experience of business has proved that no plant is 100 per cent efficient, which points the moral that the manufacturer must be everlastingly on the drive toward further elimination of waste. Those who are not keen and active on this subject probably would suffer most through lower earnings. For the one big trouble today with industry is waste, wasted efforts, inefficient machinery, unnecessary detail, waste in distribution, in handling—and what not.

The subject is too big, too important to be lightly cast aside. Only the most efficient can survive, profitably, and there can be no definite stabilization in the paper industry until each and every manufacturer realizes that this must be part of his problem.

There could well be a centralized bureau by a further development of the American Paper and Pulp Association which might aid its members in this great field through an exchange of profitable ideas by members and others. Every move toward this end should lead to future benefits.

The foregoing is from a statement given out by Paul S. Hanway, statistician of the American Paper and Pulp Association, who is convinced that the study of waste is one of the prime needs of the industry. But it is a collective as well as an individual matter, and its significance is one of tremendous future value to manufacturers everywhere.

Tappi to Middletown, October 5, 6 and 7

Three days will be spent by the members of the Technical Association and their friends in visiting the Miami Valley paper mills and plants supplying paper machinery to the industry.

The headquarters of the fall meeting will be at Hotel Manchester, Middletown, Ohio, where meetings will be held in the mornings to discuss manufacturing problems. A Middletown committee, headed by Arthur R. Harvey, of Gardner & Harvey Co., is in charge of the arrangements.

Radio Current Applied Industrially

At the Fall Meeting of the Technical Association to be held in Middletown, Ohio, at Hotel Manchester, an address of the greatest interest to paper mill men whether radio fans or not, will be given by W. D. Sommerville describing the apparatus developed by engineers of Eastern Manufacturing Company by which the basis weight of the paper and also its moisture content are recorded and controlled within very narrow limits.

This is done automatically on the paper machine by use of radio current and has been applied successfully on several machines of the Bangor company and elsewhere.

Hugh P. Baker, of the American Paper and Pulp Association, has just been invited to give an address on the paper industry at the annual meeting of the Robert Morris Associates, the national association of bank credit men, to be held at Wernersville, Pennsylvania, October 3 and 4.

Meeting of Hammermill Agents

Representative Paper Merchants from Many Cities are Guests of Hammermill Paper Company

PAPER merchants from fourteen States, including the District of Columbia, registered at Erie, Pa., on Wednesday, August 24 for a three-day conference of agents who handle the products of the Hammermill Paper Company, this being the sixteenth annual event in the history of this national organization. The scheduled place of meeting was a country club known as the Kahkwa Club, situated some ten miles west of the city of Erie, but as members arrived at the Lawrence Hotel, Erie, and registered, they were taken in automobiles to the Hammermill plant on the lake front where a reception was held in the new research laboratory of the mill, a splendid institution of stately proportions standing on a large plot of ground close to the entrance of the plant and facing the general offices. The structure consists of a five-story building and basement. In the basement are housed a cooling and air filtration system, while on the top or attic floor under the roof is a still room for the continuous production of pure distilled water, a fluid that is so necessary in all scientific operations connected with chemical testing.

New Laboratory is Impressive

As it is contemplated to have a formal opening of the laboratory, with dedicatory ceremonies, at an early date, no extended description of the building and its equipment can be given at this time. The general design and layout of the laboratory, which was constructed for mill control and practical and fundamental research work, are impressive, giving assurance of great future possibilities. Already the first floor is occupied with workers whose duties consist of checking and controlling the quality of manufactured products of paper, while chemists, engineers and microscopists are engaged on other floors in analyzing and testing raw materials, including coal, lime and wood. Dr. Bjarne Johnsen, director of the laboratory, and his chief assistants J. L. Parsons and M. A. Krimmel, will employ a staff of forty persons.

Business Sitting

After an inspection of the laboratory and parts of the mill, the visitors drove to the Kahkwa Club where luncheon was served. This was followed by a business meeting at which E. R. Behrend, president of the Hammermill Paper Company, presided. Following an introductory speech in which he extended a cordial welcome to Erie, Mr. Behrend touched on some outstanding developments during the year which had elapsed since the previous meeting, touching particularly on some of the changes that had been effected in the Hammermill sales and advertising departments.

Director Chabot

The appointment of A. Ellis Frampton as advertising manager was announced, C. W. Chabot, former advertising manager having been named director of distribution in charge of both sales and advertising. Last November, Harrison R. Baldwin was promoted to be manager of sales and continues as such.

Before closing President Behrend asked all to rise and pay silent tribute to the memory of deceased members of the organization. He mentioned the names of Carroll S. Weir, former treasurer of the Hammermill Paper Company; W. N. Russell, Western Newspaper Union, Fort Wayne, Ind., and M. D. McAlpine, of Bradner Smith & Co., Chicago, as those of respected former friends and associates who had died during the past year.

The Business Outlook

Norman W. Wilson, vice president of the Hammermill Paper Company followed Mr. Behrend with an encouraging review of the present business situation. He said he could see nothing but prosperity ahead for those well enough equipped and well enough managed to deserve it.

As director of distribution, C. W. Chabot described the plans and efforts for the promotion of sales and advertising work that were to be put into effect during the coming year. In his new position, Mr. Chabot holds a distinct advantage in being able to apply his creative and organizing ability to the development and coordination of effort in sales and advertising.

Additional aspects of work planned for the ensuing year were discussed briefly by Harrison R. Baldwin and A. Ellis Frampton, respectively sales and advertising managers.

Sales Research and Salesmen Training

In connection with a service that is now being prepared by the Business Training Corporation of New York, David Rosenblum, vice president of the corporation, gave some details that were of special interest to those present. In this connection it may be noted that President Behrend is a member of the board of directors of the American Management Association which is studying improved management methods and making researches looking to the solution of

Members of the Hammermill Agents Association in convention

pressing industrial problems related to labor efficiency, sales research and salesmen training, office management and personnel administration.

Business sittings of the Hammermill Agents' Organization were held in the forenoon during the two-days business session, the afternoons being devoted to outdoor recreation, games and sports, under the general direction of H. F. Obermanns and E. L. Heal. Prizes were awarded to the winners of the various games which included Golf, Bowling on the Green and Quoits. The list of prize winners follows:

Prizewinners in Thursday's Games

Golf: Low Gross—Prize, leather golf bag, won by Guy Beckett, with a score of 81.

1st Low Net—Prize, set of three matched clubs, won by Frank Howe, with a score of 66.

2nd Low Net—Prize, leather overnight bag, won by N. J. Patterson, with a score of 70.

Kickers Handicap—Prize, indoor putting green, won by A. C. Damon, with a score of 73; 2nd prize, one dozen golf balls.

T. S. Lathrop, C. C. Walden, Jr., and T. E. Morris tied with a score of 74. On draw, T. E. Morris won.

Approaching and Putting Contest—Prize, canvas golf bag. Guy Beckett and E. A. Petrequin tied for first place with a score of 9 strokes. As Mr. Beckett had already received one major prize, he gave way to Mr. Petrequin. 2nd Prize—Mashie niblick and putter. B. E. Reeves, W. N. Stetson and C. S. Babcock tied with 10 strokes. On draw, Mr. Babcock won.

Putting Contest—Prize, desk cigarette case. This contest resulted in five ties with 25 strokes. Messrs. Beckett and Petrequin having already received major prizes, did not participate in the drawing, leaving B. E. Reeves, W. N. Stetson and Sidney Jones. Mr. Jones won.

Bowling on the Green—First prize, banjo clock, won by W. A. Rhodes; 2nd prize, Thermos bottle, won by David Rosenblum.

Quoits—First prize, Spartan chime horn, won by H. S. Wuenschel; 2nd prize leather handkerchief case, won by Clyde Kellogg.

Friday Winners and Prizes

Golf—Low Gross—Prize, set of matched iron clubs, W. M. Stetson won with a score of 88.

Low Net—Prize, set of 3 matched clubs, won by C. E. Carpenter, with a score of 69; 2nd Prize, waterproof golf coat, won by C. R. Smith, with a score of 70.

Kickers Handicap—Prize, golf bag. W. M. Stetson and M. S. Olmstead tied with a score of 80. Mr. Olmstead requested Mr. Stetson to take the bag; 2d prize, one dozen golf balls, won by N. B. Olmstead.

Putting Contest—A set of military brushes was given for this prize, and was won by B. E. Reeves, with a score of 22.

Bowling on the Green—Prize, desk clock, won by Phil. P. McHugh; 2d prize, a barometer, won by Bryant McQuillan.

Quoits—Prize, Swede jacket, won by T. A. Ramaker; 2nd prize, men's toilet set, won by W. N. Dougherty.

New Committees Named

Before the conference adjourned on Friday, August 26, committees were appointed to serve during the ensuing year as follows:

Advisory Committee—W. G. Cleveland, E. C. Palmer & Co. Ltd., New Orleans; Frank E. Floyd, Crescent Paper Company, Indianapolis; Thos. R. Fort, Jr., Thos. W. Price Company, Philadelphia; R. L. Tillman, Beacon Paper Company, St. Louis; John D. Swigart, Swigart Paper Company, Chicago; W. B. Stevenson, Storrs & Bement Company, Boston; E. C. Mead, Richmond Paper Company, Richmond, Va.; J. Nacht, Union Card & Paper Company, New York; Harold Helmer, Beecher Peck & Lewis, Detroit; Harold Zellerbach, Zellerbach Paper Company, San Francisco.

Advertising Committee—J. H. Londergan, Henry Lindenmeyr & Sons, New York; L. A. Colton, Zellerbach Paper Company, San Francisco; S. T. Jones, Hudson Valley Paper Company, Albany; Richard Bull, Bradner Smith & Co., Chicago; C. W. Dearden, Rourke, Eno Paper Company, Hartford, Conn.; P. A. Stuhlreyer, Diem & Wing Paper Company, Cincinnati; C. J. Babcock, George Batten Company, New York; C. W. Chabot, Hammermill Paper Company, New York.

Souvenirs of the Meeting

As is customary at every Hammermill Agent's Conferenoe, all in attendance were presented with most acceptable gifts of souvenirs of the meeting. Members of the Hammermill Old Guard, numbering forty-three distributors who have been regular participants at conferences for five consecutive years or more, were recipients of a special remembrance in the shape of a desk pen set, one of Shaeffer's fountain pens, arranged to rest in a vase-like receptacle moving on a ball and socket joint which permits it to swing at any angle, the whole affair being supported on a heavy black glass base to form a beautiful desk ornament. All members and visitors were given desk reminder pads fastened to polished bronze supports with screws. Half note-size sheets of perforated blue and white paper bearing the respective imprints "Future" and "Immediate" will serve the purpose of memory joggers for engagements and things to do. In addition each visitor to the Kahkwah Club carried away with him a novelty stylograph pen of English make in the shape of a miniature quart bottle, cork and all, the gift of the United States Envelope Company, Springfield, Mass.

Hammermill Old Guard

Members of the Hammermill Old Guard in attendance at the 1927 conference included:

M. L. Kratz, Alling & Cory Company, Buffalo, N. Y.; A. H. Smith, Alling & Cory Company, Pittsburgh, Pa.; B. E. Reeves, Alling & Cory Company, Rochester, N. Y. Wm. H. Schaeffer and R. P. Andrews, R. P. Andrews Paper Company,

at the Kahkwa Club, Erie, Pa., August 24, 1927

Washington, D. C.; R. L. Tillman, Beacon Paper Company, St. Louis, Mo.; Harold Helmer, Beecher, Peck & Lewis, Detroit, Mich.; F. E. Floyd, Crescent Paper Company, Indianapolis, Ind.; P. A. Stuhlreyer, Diem & Wing, Cincinnati, Ohio; J. A. King, Dobler & Mudge, Baltimore, Md.; F. J. Weissinger, Dudley Paper Company, Lansing, Mich.; P. M. Duggan, G. J. Kuebel and J. R. Hauser, Durico Paper Company, Erie, Pa.; E. R. Carpenter, Dwight Bros. Paper Company, Grand Rapids, Mich.; T. H. Epes, Epes-Fitzgerald Paper, Richmond, Va.; Geo. McKinney, F. A. Flinn, Inc., New York, N. Y.; Fred Stutzman, Holland Paper Company, Inc., Buffalo, N. Y.; J. B. Binley, E. J. Cooper and S. T. Jones, Hudson Valley Paper Company, Albany, N. Y.; R. S. Johnston, Old Dominion Paper Company, Norfolk, Va.; W. C. Cleveland, E. C. Palmer & Co., Ltd., New Orleans, La.; E. A. Petrequin, Petrequin Paper Company, Cleveland, Ohio; Thos. R. Fort, jr., The Thos. W. Price Company, Philadelphia, Pa.; W. A. Rhodes, S. P. Richards Paper Company, Atlanta, Ga.; E. C. Mead, Richmond Paper Company, Richmond, Va.; Jas. McCracken and A. B. Sherrill, Riegel & Co., Inc., Philadelphia, Pa.; Richard S. Bull, Bradner Smith & Co., Chicago, Ill.; G. R. Likins, Springfield Paper Company, Springfield, Mo.; W. B. Stevenson, Storrs & Bement Company, Boston, Mass.; G. L. Webb, Storrs & Bement Company, New Haven, Conn.; John Swigart, Swigart Paper Company, Chicago, Ill.; J. D. Keating, Troy Paper Corporation, Troy, N. Y.; J. Nacht, Union Card & Paper Company, New York, N. Y.; A. C. Damon, Paul E. Vernon & Co., New York.; Geo. W. Ward, D. L. Ward Company, Philadelphia, Pa.; C. J. Babcock, George Batten Company, New York, N. Y.; Wm. H. Howe, Buffalo, N. Y.; W. E. Sayle, National Envelope Company, Div., Waukegan, Ill.; E. V. Johnson, United States Envelope Company, Springfield, Mass.; C. C. Walden, jr., Walden, Sons & Mott, Inc., New York, N. Y.

The Care of Motor Insulation[1]

By C. W. FALLS

Industrial Engineering Department, General Electric Company

MODERN methods of design and construction have made the electric motor one of the least complicated, and most dependable, forms of machinery in existence, and have thereby made the matter of its maintenance one of comparative simplicity. This statement should not, however, be taken to mean that proper maintenance is not important; on the contrary, it must be given careful consideration if the best performance and longest life is to be expected from the motor. The two major features, from the standpoint of their effect upon the general performance of the motor, are those of proper lubrication and the care given to the insulation, because they concern the most vital, and probably the most vulnerable, parts of the machine. The former will be discussed here only with regard to its relation to the maintenance of the insulation.

Lubrication

The designs of bearings and bearing housings of motors have been wonderfully improved in the last few years. The point has now been reached where bearings of modern motors, whether sleeve, ball, or roller, require only very infrequent attention.

This advance in the art is not yet fully appreciated, for, while there may have been some necessity for more frequent attention in the case of older designs with housings less tight than on modern machines, oiling and greasing of new motors is quite often entrusted to uninformed and careless attendants, with the result that oil or grease is copiously and frequently applied to the outside as well as the inside of bearing housings. Some of the excess lubricant is carried into the machine and lodges on the windings, where it catches dirt and thereby helps in the ultimate failure of the insulation.

The modern designs provide for a plentiful supply of oil or grease being held in dust-tight and oil-tight housings. If the proper amount of a suitable lubricant is applied before starting, there should be no need to refill the housings for several months, even in dusty places. Infrequent though periodic and reasonable attention to modern bearings of any type will tend toward longer life of both bearings and insulation.

Care of Insulation

Motors should be stored in a dry, clean place until ready for installation. Heat should be supplied, especially for larger high-voltage machines, to protect against alternate freezing and thawing. This is equally applicable to spare coils.

Motors that have been long in transit in moist atmosphere, or have been idle for an extended period without heat to prevent the accumulation of moisture, should be thoroughly dried out before being placed in service. Machines may also become wet by accident, or they may "sweat" as a result of a difference in their temperature and that of the surrounding air, just as cold water pipes "sweat" in a warm, humid atmosphere. This condition is, of course, very injurious and should be prevented, particularly in the case of large or important motors, by keeping them slightly warm at all times. Current at a low voltage can be passed through the windings, electric heaters can be used, or even steam pipes may be utilized for protective purposes. In the case of extended idle periods, tarpaulins may be stretched over the motor and a small heater put inside to maintain the proper temperature.

Drying Out

If a motor has become wet from any cause whatever, it should be dried out thoroughly before being operated again. The most effective method is to pass current through the windings, using a voltage low enough to be safe for the winding in its moist condition. For 2200-volt motors, 220 volts is usually satisfactory for circulating this drying-out current. Thermometers should be placed on the windings to see that they are being heated uniformly. Temperatures should not exceed 90 deg. C. (Class A insulation.) Applying the heat internally in this manner drives out all moisture, and is particularly effective on high-voltage motors, where the insulation is comparatively thick.

Heat may be applied externally by placing heating units around or in the machine, covering the whole with canvas or other covering, and leaving a hole at the top to permit the escape of moisture. In doing this it is essential that there be a circulation of warm air over all the surfaces to be dried. The air should be allowed to escape as soon as it has absorbed moisture. Therefore, the heaters should be so placed and baffles so arranged as to get a natural draft; or small fans may be used to force circulation. Twelve-inch fans set to blow air across the fronts of "glow heaters" and then into the lower part of a machine from opposite sides, and so on up around the windings and out the top, will produce surprising results. The temperature of the winding should not be allowed to exceed 100 deg. C. for Class A insulated motors. Smaller machines may conveniently be placed in ovens, the same temperature limits being observed.

Insulation Resistance Tests

The time required for complete trying-out depends considerably on the size and voltage of the motor. Insulation resistance measurements should be taken at intervals of four or five hours until a fairly constant value is reached. This value should at least equal the recommended A. I. E. E. Standard, which is

$$\text{Megohms} = \frac{\text{Voltage}}{\text{Kv-a.} + 1000}$$

The insulation resistance of dry motors in good condition is considerably higher than this value.

The more convenient way to measure this resistance is through the use of a "Megger," although if a 500-volt d-c. source is available, readings can be taken with a voltmeter. The ungrounded side of the system should be connected to all the motor terminals through the voltmeter, the opposite or grounded side being connected directly to the motor frame. The insulation resistance is found by

$$R = r\left(\frac{E}{V} - 1\right)$$

[1] Reprinted from August, 1927, issue of General Electric Review.

where R=insulation resistance in ohms
E=Line voltage (d-c.)
V=voltmeter reading
r=resistance of voltmeter.

In using the voltmeter method the connection to the frame should always be made through a fuse of not more than 10 amperes in size. The circuit should be tested and the side showing a complete or partial ground then connected to the frame through the fuse.

Obviously the insulation resistance varies over a wide range, depending upon moisture, temperature, cleanliness, etc., but it is a good indication of the general condition of the insulation and its ability to stand the operating voltage. Such readings should be taken before a high-potential test, to determine whether the insulation is ready for such a test, and afterwards to make sure that the high potential has not injured the insulation.

High-potential Tests

High-potential tests should be made after drying out, or after repairs, to determine the dielectric strength of the insulation. New windings should successfully stand a high-potential test of twice normal voltage plus 1000. There is some disagreement as to the proper value to use for motors that have been in operation for some time, but it is reasonable to assume that, after thorough cleaning and drying, the winding of a used motor should stand 150 per cent of normal voltage for one minute.

Small high-potential testing sets are available for such work and are of such capacity that very little damage will result from a breakdown during the test.

Periodic Inspection

A systematic and periodic inspection of motors is necessary to insure best operation. Of course, some machines are installed where conditions are ideal, where dust, dirt, and moisture are not present to an appreciable degree; but most motors are located where some sort of dirt accumulates in the windings, lowering the insulation resistance and cutting down creepage distances. Steel mill dusts are usually highly conductive, if not abrasive, and lessen creepage distances. Other dusts are highly abrasive and actually cut the insulation in being carried through by the ventilating air. Fine cast-iron dust quickly penetrates most insulating materials. Hence the desirability of cleaning the motors periodically. If conditions are extremely severe, open motors might require a certain amount of cleaning each day. For less severe conditions weekly inspection and partial cleaning is desirable. Most machines require a complete overhauling and thorough cleaning about once a year.

For the weekly cleaning the motor should be blown out, using moderate pressure, dry, compressed air (of about 25 to 30 lb. per sq. in. pressure). Where conducting and abrasive dusts are present, even lower pressure may be necessary, and suction is to be preferred, as damage can easily be caused by blowing the dust and metal chips into the insulation. On most d-c. motors and large a-c. motors the windings are usually fairly accessible, and the air can be properly directed to prevent such damage.

On the larger a-c. machines, the air ducts should be blown out so that the ventilating air can pass through as intended.

On large machines, insulation resistance readings should be taken in the manner indicated earlier in this article. As long as the readings are consistent the condition of the insulation would ordinarily be considered good. Low readings would indicate increased current leakage to ground, or to other conductors, owing to one of perhaps several causes, such as deteriorated insulation, moisture, dirty or corroded terminals, etc.

Cleaning

About once a year, or oftener if conditions warrant, motors should be overhauled. Smaller motors, the windings of which are not particularly accessible, should be taken apart.

First, the heavy dirt and grease should be removed with a heavy, stiff brush, wooden or fiber scrapers, and cloths. Rifle-cleaning bristle brushes can be used in the air ducts. Dry dust and dirt may be blown off, using dry compressed air of 25 to 30-lb. pressure, taking care to blow dirt out from the winding. As stated before, if the dirt and dust is metallic, conducting, or abrasive, air pressure may drive the material into the insulation and damage it. Hence, for such conditions, pressure is not so satisfactory as a suction system. If compressed air at low pressure is used, care must be taken to properly direct it so that the dust will not cause damage and will not be pocketed in the various corners.

Grease, oil, and sticky dirt are easily removed by applying cleaning liquids like carbon tetrachloride (Pyrene, Carbona), gasoline, or naphtha. All of these liquids evaporate quickly and, if not applied too generously, will not soak or injure the insulation. Carbon tetrachloride is best and is recommended because it is non-inflammable.

In case one of the other liquids must be used, it should be applied out of doors or in a well-ventilated room. It must be remembered that gasoline or naphtha vapor is heavier than air and will flow into pits, basements, etc., and may remain there for hours or even days. The casual smoker, a spark from a hammer or chisel, or even from a shoe nail may cause a serious explosion. Therefore, proper ventilation of the room is essential and may require specially piped ventilating fans. In using carbon tetrachloride the explosion hazard is eliminated, but some ventilation is required to remove the vapor, which might affect the safety and comfort of the workmen.

There are several good methods of applying the cleansing liquid. A cloth, saturated in the liquid, may be used to wipe the coils. A paint brush, dipped in carbon tetrachloride, is handy to get into corners and crevices, and between small coils. Care should be taken not to soak the insulation as would be the case if coils or small machines were dipped into the liquid.

Probably the best method of applying the liquid is to spray it on. A spray gun, paint spraying appliance, or an ordinary blow torch are often used with good results, although the latter device is apt to give a heavier spray than desirable.

An atomizer will give excellent results, using a pressure of about 80 lb. if the insulation is in good condition, or 40 to 50 lb. if the insulation is old. The atomizer should be held not more than 5 or 6 inches away from the coils.

While the insulation will dry quickly at ordinary room temperature after such cleaning methods, it is highly desirable to heat it to drive off all moisture before applying varnish. This heating or drying-out process has already been discussed and, therefore, need only be mentioned here.

If the motor can be spared from service long enough, the insulation should be dried out by heating to from 90 to 100 deg. C. While warm, a high-grade insulating varnish should be applied. For severe acid, alkali, or moisture conditions, a black plastic baking varnish is best, while for conditions where oil or dusts are present, a clear or yellow varnish should be used.

The varnish may be sprayed or brushed on. For small stators or rotors, it is best to dip the windings into the varnish, cleaning off the adjacent metal parts afterwards by using a solvent of the varnish. After applying the varnish, the best results are obtained by baking for 6 to 7 hours at about 100 deg. C. Experience with particular conditions of operation, or the condition of the insulation, may indicate the desirability of applying a second coat of the same varnish, followed again by 6 to 7 hours of baking at 100 deg. C.

If the machine must be put back in service quickly, or if facilities are not available for baking, fairly good results will be obtained by applying one of the quick-drying black or clear varnishes which dry in a few hours at ordinary room temperatures.

Testing

Insulation resistance readings should be taken, as explained previously, to determine whether the winding is in satisfactory condition for applying a high-potential test. After this test, it is good practice to run the motor without load for a short time, to make certain that everything has been connected, assembled, and adjusted properly.

Forestry in the Paper Industry[1]

By D. A. CROCKER

Woodlands Section, American Paper and Pulp Association

THIS opportunity to discuss the place of forestry in the pulp and paper industry is especially welcome because of the interest your association has shown in the subject. This interest has not been confined to resolutions and conversation, but for the last two years has been evidenced by generous contributions to the work of the Woodlands Section of the American Paper and Pulp Association, and as secretary of that section, I am particularly glad of an opportunity to express our appreciation of your financial support and to tell you of some of the possibilities of our work.

The strongest evidence that forestry has become established in the pulp and paper industry is the interest in the subject which your association has shown and is continuing to show. You represent the group in the industry which is dealing with its most practical problems and the nature of your work makes your approach to any problem an intensely practical one. I, therefore, take it that you are interested in the practical aspects of forestry for the pulp and paper industry and will try to emphasize this phase of the subject in my paper.

The definition of "forestry" which I prefer to all others is that "Forestry is the Management of Timberlands for the Continuous Production of Forest Crops." I like this definition for two reasons—first, because it emphasizes the continuous feature of forest management and second, because it speaks of "forest crops." The products of the forest are as much a crop as the products of the field although they differ greatly in the length of time between harvests. It is a lack of realization of this fact which has made the general public slow to understand forestry and has made our own and other wood-using industries somewhat slow to see the necessity for the practice of forestry to insure their supply of raw material.

The pulp and paper industry, as it exists today, not only in this country, but throughout the world, has been built up on the utilization of wood. Many attempts have been made to find substitute materials and we are continually reading about the use of corn stalks, various grasses and other fibre plants as substitutes for wood in the manufacture of paper. They now have certain limited uses and may have still others in the future, but those of us who are thoroughly familiar with our industry realize that cellulose is produced in the cheapest and most readily utilizable form in the forest and that there is no prospect of any decrease in the demand for pulpwood, but that the demand will probably increase in nearly direct proportion to the increased demand for paper.

I am not one of those who believe that the pulp and paper industry must be abandoned in the older regions because of the growing scarcity of pulpwood. It is absolutely unnecessary for this to happen. Nevertheless, we are facing a scarcity in some regions, and active measures, both governmental and private, must be taken promptly if the industry is not to suffer in those localities.

Consumption Versus Growth

The current impressions as to a future scarcity of pulpwood are based on the fact that the annual consumption of many of the most desirable pulpwood species exceeds the annual growth, particularly in the regions in which the pulp and paper industry has been long established. In the northeast, for instance (New England, New York and Pennsylvania), the 1925 consumption of spruce, balsam and hemlock was approximately 2,500,000 cords and the 1926 consumption probably reached 2,600,000 cords. In addition, there is an annual cut for lumber and other purposes of approximately 1,200,000 cords of these species, making a total commercial drain of 3,800,000 cords.

Contrasted with this consumption, the present-day growth has been estimated by the United States Forest Service at 1,370,000 cords. In other words, the commercial consumption of these highly desirable pulpwood species in the Northeast, is almost three times the annual growth. This would be a serious situation if there was no hope of an increase in the annual growth. A great increase in the annual growth can be obtained through the practice of forestry and a little later in this paper, I shall try to show you the possibilities of future growth.

The pulp and paper industry in the Lake States has also been built up largely on the supply of spruce, balsam and hemlock found there. We find an annual consumption of spruce and balsam very much greater than the annual growth. The hemlock situation in the Lake States is dominated by the lumber industry and will probably continue to be so dominated for the next twenty-five years. At the present time, the growth of this species is negligible while the consumption for all purposes is equivalent to about 1,800,000 cords.

The Lakes States consumption of spruce and balsam, for all purposes, is between 900,000 and 1,000,000 cords per annum, about 90 per cent of this being for pulpwood. The annual growth is estimated at 200,000 cords a year, indicating that the supply of these species in the Lake States is being consumed even more rapidly than in the Northeast.

In the Southern states, we find three distinct problems of pulpwood supply. The first of these concerns the supply of spruce, balsam and hemlock for the sulphite mills. This is primarily a problem for a few individual mills and is being attacked so intelligently by them that I shall only mention it in passing.

The second problem concerns the supply of yellow poplar, basswood, gum, etc. for the soda pulp mills. Here we have a very large potential supply of pulpwood with an annual growth much greater than the present consumption. The complicating feature in this case is the fact that the pulpwood species form a relatively small percentage of the total stand in the hardwood forests of the Southern Appalachians, probably not more than 25 per cent of the total, and it has therefore proved difficult for the mills to obtain an adequate supply of reasonably priced pulpwood within a reasonable distance. It is not so much a question of supply as of the best method of obtaining the supply at a reasonable cost.

The third problem in the South is that of the supply of pine for the sulphate mills. It varies in different localities but generally speaking, there seems no need to fear a shortage of pulpwood, although there are possibilities that too great a concentration of the pulp and paper industry in a particular region may lead to excessively high priced pulpwood in that region, particularly if too great reliance is placed on purchased wood.

It is estimated that with the very inadequate fire protection which is being given the Southern pine lands at the present time, the annual growth of trees now merchantable is approximately 70 per cent of the consumption for lumber and probably more than 50 per cent of the total consumption for all commercial purposes. In addition, there are millions of acres of young pine under commercial size which will reach maturity in from ten to twenty years, if protected from fire, so there seems no reason to doubt that for the Southern pine belt as a whole, the practice of forestry can bring about a proper balance between growth and consumption for all purposes.

What Forestry Can Do

The situation presented above has been known in a general way for a number of years and was the principal reason for the organization of a Woodlands Section of the American Paper and Pulp Association. The leaders of the industry realized that it was essential to know whether its future was to be imperilled by a scarcity of its most important raw material, and that the best and quickest way to answer the question was through our own investigations. The United States Forest Service and other public research agencies have devoted much time to the study of the problem of pulpwood supply, but principally as a part of the general study of the subject of forest depletion and replacement. After all, we are only one of several important wood-using industries and cannot expect public agencies to devote all their time to our particular problems.

By means of the Woodlands Section, the industry has been able to carry on its own investigations, supplementing those

[1] Presented at the eighth annual convention of the American Paper and Pulp Mill Supts'. Assn., held at Richmond, Va., May 26, 27 and 28, 1927.

made by public agencies and imparting the results in terms of pulpwood supply. I do not want to minimize in the slightest degree the important work done by the United States Forest Service and others, but rather to point out that we can and must contribute to the solution of our own problems.

It is because of the surveys the Woodlands Section has made in the Lake States and in Virginia and North Carolina, and its contacts with the latest developments in other regions, that it is possible to show you in the following portion of this paper that our pulpwood situation is far from being as serious as might be supposed from the present-day ratios between growth and consumption.

The Northeast.—At the same time the United States Forest Service estimated the present growth of spruce, balsam and hemlock in the seven Northeastern states, at 1,370,000 cords, it also estimated the potential growth of these species under the intensive practice of forestry by the Federal Government, the State and the private owner, at a little over 4,750,000 cords. This is one and one-quarter times the present total consumption of 3,800,000 cords. In view of the fact that the softwood lumber industry in the Northeast is still declining rapidly and that the rate of expansion of the pulp and paper industry is not likely to be any greater than the rate of decline in the softwood lumber industry, we can look forward to a considerable eventual margin of growth over consumption. The scarcity will come during the next twenty-five years when the present visible supply is still more depleted and the future supply has not yet reached commercial size. When we are dealing with a crop which requires forty years or more to mature, we must plan in decades and generations and although this Northeastern region can produce sufficient pulpwood to maintain the industry at its present rate and allow for some expansion, it cannot do so unless prompt action is taken to establish the practice of forestry throughout the whole region.

The Lake States.—In the Lake States, the potential growth of spruce and balsam has been estimated at 1,400,000 cords per annum, as contrasted with a total commercial consumption at the present time of nearly 1,000,000 cords. The margin of possible growth over present consumption is greater than for the Northeast, although the prospects for the immediate future are not quite as good. Director Zon of the Lake States Forest Experiment Station stated in a paper he presented at the Annual Meeting of the Woodlands Section of the American Paper and Pulp Association, that the problem of the supply of spruce and balsam in the Lake States could be solved and that the question of future supply in these states is wholly in the hands of the pulp and paper industry.

A marked improvement in State fire protection organizations, recent and prospective forest tax legislation and recent research developments combine to make the Lake States outlook radically different from that of a few years ago. I think that Director Zon was not unduly optimistic and that the greatest problem in this region may be that of getting our industry to realize that its future is not the uncertain one many have believed.

The South.—I have already indicated that the question of natural supply in the South is not a serious one. The problem of the forester in this region is rather one of devising the best means of providing low priced pulpwood than of finding pulpwood in a region of scarcity. This problem has already been solved by some of the largest manufacturers of sulphate pulp who seem likely to have perpetual supplies of pulpwood from their own lands at a cost no greater than at present, and there is no reason to doubt that other mills can solve the problem in the same way. The soda pulp mills are also meeting their problem intelligently and those who have gone the furthest in their plans for the practice of forestry are the most optimistic in regard to a future supply at a reasonable cost. The ratio between consumption and growth of the soda pulp species in the South is of little or no value, not only because of the fact that the problem is one which must be worked out for the individual mill in competition with other wood-using industries, but also because the seriously depleted condition of the Southern Appalachian forests makes present growth estimates of very doubtful value and we have not sufficient data on potential growth to make prophesy safe. We do know that in certain restricted localities where fire has been kept out and cutting has happened to favor the more desirable species, the growth is startling.

How Forestry Can Solve the Problem

Our Eastern forests, taken as a whole, are in a badly run down condition. They cannot reach their maximum potentialities for growth unless there is concerted action at an early date by all interested agencies. I firmly believe that the pulp and paper industry can and will solve its forest problems with relatively slight assistance from public agencies. Nevertheless, there are certain phases of forestry in which there is a public responsibility as well as a private opportunity and without the full acceptance by the public of its responsibility, the private practice of forestry cannot be successful.

Public Measures.—The first of these is adequate fire protection. Although there are certain limited areas in which the private owner may be able to protect his land from fire at a reasonable cost and although the private owner will always find it necessary to supplement state agencies if he is to have complete protection, the Federal Government, the State and the local community must co-operate with the private owner to secure the total protection necessary if our forest land is to reach its full producing capacity. This principle has been recognized in our basic forest law—the Clark-McNary Act—but Federal appropriations have not as yet been sufficient to make the principle fully effective. The major portion of the burden of fire protection must be borne by the State and local communities and it is here that the greatest room for improvement is found.

A recent publication of the Natural Resources Production Department of the Chamber of Commerce of the United States, ranks the various states according to their accomplishments in fire protection at the present time. Of the thirty-eight forest states in the country, only one has appropriated more than 80 per cent of the funds necessary for adequate protection. Four have appropriated from 60 to 75 per cent and eleven have appropriated from 40 to 60 per cent. Of the remaining twenty-one, only three have appropriated as much as 25 per cent of the necessary amount and all of the other appropriations are less than 20 per cent of the amount considered necessary to furnish adequate protection. Progress in recent years has been rapid and the public is really beginning to realize the necessity for adequate fire protection, but an enormous amount of educational work remains to be done. The pulp and paper industry should use its influence to secure efficient action by government agencies, in addition to bearing its proper share of the burden of protecting its own lands.

No industry can be expected to grow pulpwood, or any other crop, at a loss. In the past, improper methods of taxation have made the possibility of the profitable production of forest crops seem a remote one. I shall not burden you with details of forest taxation since the situation varies in every state, but will call your attention to the fact that many states have already adapted the method of forest taxation to the character of the forest crop. Next to adequate fire protection, this is the most important public contribution to a practice of forestry and the situation shows every sign of rapid improvement. Among the Southern states, Louisiana and Alabama have been leaders in adopting correct principles of forest taxation.

The third important phase of the public's contribution to the practice of forestry is forest research, including research in utilization. We know that where trees have grown, trees will grow again and in a general way we have some idea as to the rate at which they will grow. We are only beginning, however, to learn the best methods of securing the maximum growth at the minimum expense, whether the forest is a second growth following one cutting, or whether it is artificially planted.

Progressive timberland owners will carry on a certain amount of research of their own but the foundation must be laid by the various federal forest experiment stations and the pulp and paper industry is interested in seeing that these stations secure sufficient funds to push their work forward as rapidly as the character of the problems will permit.

I need not emphasize to you the excellent work in research in utilization which has been done by the United States Forest Products Laboratory, at Madison. I will, however, remind you that the development of new processes for the utilization of additional species in the manufacture of pulp can prove a very important factor in tiding the industry over a period of shortness of supply, which may come before our forest lands are all on a satisfactory producing basis. Concrete illustrations of this are the increased use of jack pine in the Lake States, the possibilities of using the northern hardwoods for sulphite pulp, the development of the semi-chemical pulping process, the rod, mill, etc.

Another public phase of forestry which may affect the pulp and paper business in the East, to a slight extent, is the increase in the area of our state and national forests. It seems unlikely that these will ever be primarily devoted to the production of pulpwood or any other forest crop which can be produced in a relatively short time. Also, the total area of state and national forests east of the Rocky Mountains will probably never be very great. Nevertheless, such forests are desirable both as additional sources of raw materials and also as large scale laboratories which can point the way to the private owner.

Private Measures.—I have shown you that at the present time there are certain regions in which the consumption of pulpwood species is greatly in excess of the annual growth, but that the growth can be made to exceed the consumption. Let me add that the most recent investigations of growth possibilities for spruce, balsam and hemlock in the Northeast and the Lake States promise even better growth than the forest service originally believed possible under the intensive practice of forestry so that the situation is even more hopeful than might be assumed from the figures I quoted.

The companies which have already assured themselves of adequate supplies of pulpwood for an indefinite length of time, point the way to the rest of the industry. They have found that the intensive practices of forestry enable them to provide for the indefinite operation of their mills at less expense than if they relied on continuing purchases of additional timberlands. In the Northeast, for instance, the present growth in the spruce-balsam region, is approximately one-tenth of a cord per acre per annum. Intensive forestry will increase this growth to an average of at least one-third of a cord. Many areas will produce pulpwood at an even faster rate but these must be averaged with less productive areas.

On this basis a mill consuming 50,000 cords of pulpwood a year, would require 500,000 acres of timberland if it did nothing beyond protecting its holdings from fire. On the other hand, the mill practicing intensive forestry would require 150,000 acres to provide for its present consumption, or perhaps as much as 200,000 acres to allow for expansion and a margin of safety.

The carrying charges on timberland in the Northeast probably average about $1.00 per acre per year including taxes, interest, etc. The mill which relies on natural growth, therefore spends $300,000 annually in holding the extra 300,000 acres required for its complete protection. Also, new lands will usually be at some distance from the mill, with consequent higher operating and transportation costs.

The total expense of the practice of intensive forestry probably need not exceed $1.00 per cord per year on the annual cut plus an average of 50 cents per acre for various improvement measures on land which has been cut over in the past and is not now producing up to its full potentialities. In other words, the total expense for forestry measures on 200,000 acres of land would not exceed $150,000 per year, while the carrying charges on the extra 300,000 acres would be double that, making a net saving of $150,000 per annum. It would not be practicable or desirable to spend 50 cents a year on each individual acre but rather $5.00 per acre once in ten years. It will not be possible for many companies to immediately place their land in a fully productive condition, so that outside purchases of wood, stumpage or excess land may be required. The saving through the practice of forestry would be reduced proportionately during the period necessary to place the required acreage on a maximum producing basis, but there are very few cases in which there will not be some current saving and the more rapidly the company moves, the more quickly the full saving can be realized. Furthermore, costs will decrease greatly once every acre has been made fully productive.

In the Lake States, conditions are very similar, although the particular measures necessary to make the land produce to full capacity will differ considerably. In both cases, a certain amount of planting may prove desirable on acres which have been wholly unproductive by fire or other causes. I am not advocating planting for very large areas but suggesting it as a supplement to other phases of forest management when, as and if, it will be profitable.

In the Southern pine region, the problem of producing future supplies of pulpwood is so simple that a greater percentage of our industry is practicing forestry in this region than in any other part of the country. The few mills which have not yet taken active measures are studying the situation and if action is not delayed too long, should be able to provide for the future at a reasonable cost.

In the mountain region, the small percentage of the pulpwood species in the total stand makes integration of the various wood-using industries seem the profitable solution. Desirable lands near the mill which will produce a large volume of pulpwood can probably be purchased in sufficient quantity to provide for a considerable percentage of the mills' requirements, but even on the most desirable lands there will be much timber which the pulp mill cannot utilize. The best possibilities for integration are with the saw mill industry and the mining industry. It is also possible that the future development of various new forms of chemical utilization f wood will help the pulp mill to solve its problems. At the annual meeting of the Woodlands Section, Dr. Rue suggested this as one of the most important factors to be considered in solving the pulpwood supply problem of the Southern Appalachians. It is impossible to make blanket recommendations for a forest region as varied in character as the Southern Appalachians, but, as previously stated, investigations by some mills promise indefinite supplies of pulpwood at a reasonable cost, through the practice of forestry combined with integration with other wood-using industries.

The Possibilities of Utilization

Before concluding the discussion of measures which our industry can take to provide for its future supply of pulpwood, I want to call your attention to the possibilities of the utilization of new species as a substitute for those now considered most satisfactory. You are probably as well informed as to these possibilities as I am but you may not realize their full effect on the future pulpwood supply of the country.

We foresters are confident that we can greatly increase the present growth by relatively inexpensive means. We are dealing with nature, however, and must obey natural laws if we are to be successful and we cannot produce spruce on sites more suitable for hardwoods, or, if we can produce it, can only do so at prohibitive cost. For this reason, the forester connected with the pulp and paper industry is not only interested in stimulating the growth of certain species on land suited for that purpose, but he is also vitally interested in the possibility that the other species found in a given region can be utilized for pulpwood. This is not only because it will simplify his problems but also because it will materially reduce the cost of forest management.

I do not intend to discuss this problem at length but rather wish to call it to your attention as one way in which the members of the Superintendents' Association can be of real service in protecting the future of our industry. Various agencies are continuously experimenting with processes which involve the use of new species and from time to time one of these processes passes from the laboratory to the commercial stage.

I do not ask you to venture into unprofitable experimental fields, but do suggest that an open-minded attitude toward the utilization of species now considered undesirable may not only prove profitable in individual cases but may also help to carry the industry through the period of shortage before the intensive practice of forestry has insured our future supply of the most desirable species.

Conclusion

If I have been successful in conveying my ideas to you, I have made you realize that our industry must practice

forestry to make certain of its future supplies of raw material at a reasonable cost, and that in certain regions the individual mills must move rapidly if they are not to suffer in the future. Forestry has a place in our industry because it is profitable for our industry. There is no other justification for its practice. The public has certain responsibilities which must be accepted if the practice of forestry is to become practical in all cases. Our industry not only has responsibilities but opportunities which are already realized by some. There will undoubtedly be a few laggards who will suffer by waiting until the proper time for action is past, but I believe that these will be few in number and that our industry can be trusted to provide its own future supplies of pulpwood on a profitable basis.

Meeting of the Cellulose Division of the American Chemical Society at Detroit

Chemists from all parts of the United States and Canada met at Detroit to attend the 74th meeting of the American Chemical Society. They were the guests of the Detroit chemists, who received their colleagues with a hearty welcome.

The meeting opened at the Hotel Statler on Labor day, and continued until Saturday, September tenth. Numerous general talks, including speeches by President George Rosengarten, of Powers, Weightman and Rosengarten of Philadelphia, by Mr. John Smith, Mayor of Detroit, and by Mr. Charles F. Kettering, Vice-President of the General Motors Corporation, helped to make the meeting an unusually entertaining one. Interesting trips—including a moonlight boat-trip on the Detroit river—and visits to Mr. Henry Ford's River Rouge and Highland Park plants, furnished diversions for the visiting scientists.

The Chemical Society boasts of no less than 19 separate and distinct divisions, and one of these is the important division of Cellulose Chemistry, the meetings of which were held on the 13th floor of the Statler, on Wednesday, September 7th. Unfortunately the genial Dr. Bjarne Johnsen was unable to take the chair. Business kept him at Erie. However, the Cellulose Room was frequently filled to capacity, and the pulp and paper industries were well represented.

Papers and Committee reports that may be of special interest to the readers of THE PAPER INDUSTRY are included in the following list:—

1—Dr. George L. Clark's beautifully illustrated lecture on the "Contributions of X-ray Science to the Analysis of the Structure of Cellulose," in which he emphasized not only the use of the X-ray method as a scientific aid, but as a practical tool which would help the man in the cellulose industry. Dr. Clark's paper was discussed by Professor Hibbert of McGill University and by Dr. Davey, formerly of the General Electric Co.

2—Two very carefully prepared papers by Dr. George J. Ritter of the Forest Products Laboratory at Madison, Wisconsin. The first dealt with the composition and structure of the cell wall of wood, showing in what portions of the cell, lignin was found, and how the cell wall could, under proper treatment, be broken down into miniature fibrillae. The second paper, written in collaboration with Dr. Fleck, dealt with effect of gradual chlorination on wood.

3—A contribution by Professor Hibbert and Mr. Fowler of McGill University on the estimation of furfural, which, it will be remembered, serves to characterize the pentosans which always occur in wood and in pulp.

4—A report of the work on "vasculose," in the cell wall of oat-straw, carried, out by Professor Bertrand and Dr. Wise at the Pasteur Institute at Paris.

5—The splendid co-operative work of the Alpha cellulose committee under the chairmanship of Dr. Ritter, who reported the unusually concordant results obtained with the method by eight different laboratories.

6—The carefully worded report of Dr. E. C. Sherrard, also of the Forest Products Laboratory, dealing with the difficulties and snags encountered by the "Copper Number Committee." This paper led to an interesting and rather heated discussion as to whether the copper number was really worth bothering with. After arguments "pro" and "con," in which Drs. Hibbert, Esselen, Gray, Wang, and numerous others took part, it was formally decided to attempt further improvements in the copper number analysis and the committee was given a vote of thanks, and retained.

7—An interesting literature report on oxidized cellulose by Dr. John L. Parsons, of the Hammermill Paper Co., and Mr. Harry Le B. Gray's excellent summary of the technique used in preparing the costly "standard" (cotton) cellulose were also very favorably received.

The Cellulose Division also went on record as favoring the McSweeney Bill, now in committee at Washington, which would provide for more adequate research work in forestry.

While the Cellulose Division was holding its meetings, the Division of Water, Sewage and Sanitation held an important symposium on **Trade Wastes**, which included a paper by L. F. Warrick, on Some Chemical Characteristics of Sulphite Waste Liquor.

Paper Exhibits at Graphic Arts Exposition

Exhibits at the fourth Educational Graphic Arts Exposition, which opened at Grand Central Palace, New York, on Monday, September 5 (Labor Day), to last a fortnight, included several of interest to pulp and paper manufacturers, apart from the products of paper mills like the Strathmore Paper Co., Hammermill Paper Co., S. D. Warren Co., and Louis DeJonge & Co.

The exposition opened at 2:30 P. M. with addresses by William A. Renkle, president of the Exposition; John J. Dering, president of International Association of Printing House Craftsmen; Ernest F. Eilert, president of the United Typothetae of America; Harry A. Porter, vice president of the International Printer's Supply Salesmen's Guild; Kimball A. Loring, president of the International Trade Composition Association, and A. E. Giegengack, first vice president of the International Association of Printing House Craftsmen and General Manager of the Exposition, who won the admiration of a large audience by a speech of great brevity and pointed humor.

In a forceful address, President Eilert drew attention to the position of printing among the other great industries of the United States. When combined with paper and the graphic arts, printing was the fourth national industry of the United States, and the second largest industry in New York City. According to the census of 1923, printing, publishing and the pulp and paper industry was valued at $3,129,000,000; measured by wages and salaries, printing was second in national importance and third by reason of the number of persons engaged in it.

The exhibits made by pulp and paper manufacturers have been especially designed to interest consumers. The Hammermill Paper Co., have perhaps the most impressive display of any, a reception space enclosed by wooden pillars bearing chains of rope, has as a centerpiece a long, roomy table at which visitors can sit on comfortable upholstered chairs. Facing the visitor as he enters is the sign of the company and below this, flanking a large showcard on which are reproduced many magazine advertisements to show how printers are enabled to sell business printing, are a series of educational tablets, photographic and letterpress, bearing on the manufacture and sale of paper.

The United States Envelope Company's exhibit is superlatively attractive because of the color and lighting schemes employed. Most of the paper exhibits consist of printing papers, embossed and lithographed to show them off to best advantage to consumers.

Art in printing is beautifully displayed in the Graphic Arts Gallery on the third floor of the Palace, where the modern processes of rotogravure, aquatone and multiple color printing can also be seen in operation.

Paul S. Hanway, statistician of the American Paper and Pulp Association, spent the week of August 29 calling on mills in the Fox River valley of Wisconsin and in Kalamazoo. En route Mr. Hanway spent a day at Northwestern University at Evanston, Ill., where he gave two talks on the subject of trade association statistics at the National School for Commercial Trade Association Executives.

The Month at Washington

RENEWED recommendations will be made to Congress, when it meets next December, for a revision of the flexible provisions of the Tariff Act of 1927, it was recently announced at the U. S. Tariff Commission, and its recommendations will be embodied in the 11th annual report to Congress. It is also sought to revise Section 315 of the act which authorizes the commission to obtain foreign and domestic production costs, because it is impossible to get in actual dollars and cents what it actually costs to produce a commodity in a foreign country.

House Committee on Tax Revision—The Committee on Ways and Means will hold public hearings on proposed changes in the tax laws during the week beginning October 31st. All those interested in presenting arguments for or against proposed changes, should get in touch with Rep. Wm. R. Green, Chairman. The committee does not plan to hear anyone who will not appear voluntarily, and will not summon any witnesses.

Baltimore Census Figures—The Census Bureau has just released a detailed report on sales, merchandise outlets, number of establishments retail and wholesale, employees, wages and inventories, covering the paper trade in the City of Baltimore, as well as other commodities, which report is obtainable upon application to the Bureau.

This is the first of a series of 11 census reports covering 17 cities of the U. S. which furnishes a complete picture of the economic life of these industrial centers, and of their commercial activities. A detailed report of Fargo, N. Dak., is also being made available, this being the second city to be completely tabulated, and by December 1st, it is expected that all the data for the remaining cities will be available for distribution, viz: Atlanta, Chicago, Denver, Kansas City; Providence, San Francisco, Seattle, Springfield, Ill., and Syracuse, N. Y.

This census was begun last February, nearly 500 special census-takers being employed in the work, under the auspices of local chambers of commerce. When completely tabulated, these figures will furnish an index to the business turnover and the wealth of the respective communities, giving an exhaustive wholesale and retail showing for each city, of the amount of business transacted annually, the number of people engaged in these businesses, and presenting a picture of the commercial mechanism of each city, which will serve as a guide for other cities similarly situated.

The Baltimore Census shows 28 wholesale establishments selling paper and paper goods, with 498 employees, and 19 firm members or proprietors, with salaries and wages in 1926 of $980,000, with an actual inventory on Dec. 31 of $1,151,500, and with net sales aggregating $13,673,900, an average per establishment of $488,554, with only 150 selling employees and 348 non-selling employees, with an average wage paid of $1,968 per employee.

In the retail end we find no classification for retailers of paper and paper goods, but we find that there are 73 stationers in Baltimore, through whom these products are retailed, while 44 so-called department stores would also act as outlets, as would some 367 drug stores, and 37 5c and 10c stores, etc.

Commercial Espionage Prohibited—Any system of espionage used by a company to obtain information as to facilities, capacities, operations or the customers of a competitor, without its consent, is an unfair trade practice and constitutes unlawful competition, according to a recent ruling of the Federal Trade Commission, which issued a cease and desist order in this connection, and also prohibited the circulation of misleading circulars, and other printed statements, regarding either the products of a competitor or the competitor's ability to fill orders and make deliveries, or with reference to its financial standing or its business methods.

Radio Advertising Falls Under Ban—The first trade practice case involving the radio for advertising products was recently before the Federal Trade Commission which issued a complaint against a company for making false statements over the radio in representing its products to the public, the statement challenged being that "the company eliminated needless profits by manufacturing its products and selling them direct to the consumer."

Inquiry into Prices—An investigation into the methods used in quoting and charging prices to the consumer is announced by the Federal Trade Commission, in which the delivery-price method, the factory-base method, and the basing-point method of price fixing will come under the scope of the inquiry, with a view to determining what are fair prices in regard to price quotations.

This investigation results from the recent "price bases resolution" adopted by the commission. Three definite modes of quoting and charging prices with reference to the locality of the purchaser will be studied. It is pointed out that numerous companies who distribute their products in various states are quoting prices in which no allowance is made for differences in transportation costs in widely separated markets. This is the delivery price method. Then other distributors employ the policy of quoting uniform prices at the factory, or the factory base method, while still others follow the practice of adding to the market price at a certain basing point the freight charges from that point to the locality of the consumer, or the basing point method. The inquiry will assemble facts and data from which to study competitive conditions, and form a basis for determining what are the fair practices in this regard, and incidentally touching upon unfair competition.

Policies Revised on Trade Practices—The Federal Trade Commission in a pamphlet just issued, reviews recent changes in its rules, policy and procedure, settlements and publicity given to cases before it, which may be obtained upon application. Among other things, it is now the commission's policy to settle all cases where the public interest does not demand prosecution and publication, except cases involving fraudulent practices which are prosecuted and given full publicity; to afford opportunity to all business interests to first show cause why a complaint should not issue and meanwhile withholding publicity on such cases, as well as on cases settled by stipulation without a complaint being filed; refusing to divulge the name of a complaining party; non-interference in purely private controversies; encouraging trade practice conferences with industries as units to avoid unfair competition and consequently prosecution. The pamphlet also outlines all procedure before the Commission.

Survey of Shipping Data to Cover World—A joint program of oceanic shipping research is to be undertaken by the U. S. Shipping Board and the Department of Commerce in the near future, according to plans recently consummated, which call for a study of foreign ports, cargo handling, packing, cargo storage, compilation of laws, rules and regulations with reference to shipping, census of foreign warehouses, including their facilities, charges, etc., and also the development of regular reports on bunkering facilities throughout the world. Individual reports on approximately 60 leading ports of the world are to be issued, and the remaining 700 ports are to be covered in two or three additional volumes, with from one paragraph to several pages devoted to each port. In the development of this program, pamphlets and bulletins will be issued in popular style on such subjects as marine insur-

ance, ocean bills of lading, through export bills of lading, packing for foreign markets, stowage of ship's cargoes, etc. All publications will issue from the U. S. Shipping Board.

Postal Notes of Interest—Effective Sept 1st, the Post Office Department inaugurates a new method of filing receipts for insured parcels delivered, forwarded or returned at all first class post offices, by the numbers instead of by the name of the addressee or by the office origin and parcel number. Delivery of insured mail on firm delivery sheets will not, however, be affected by this new system.

Use of air mail postage stamps on other than air mail is objectionable and not approved by the Post Office Department, and patrons are requested to confine the use of such stamps to the payment of postage and fees on matter which is to be transmitted by the contract air mail service. Air mail stamps are designed for use on air mail only, and when affixed to other matter which is not sent by airplane, confusion results.

Commerce Year Book for 1926—The "Commerce Yearbook for 1926" in 2 volumes, just released by the Department of Commerce, shows a record volume of production and trade in this country during the last year, and in Volume 1, pages 545-561, will be found a discussion of pulp, paper and paper manufactures, printing and publishing. Volume 1 contains detailed information concerning business conditions in this country, while Volume 2 shows data for about 70 foreign countries.

Bibliography of Corporation Financing—A list of books on corporation finance, including problems of investment and promotion, has been prepared by the Library of Congress, and is obtainable upon application. The name of the author, the title of the book, something of its scope, and the name of the publisher is given in each instance.

Income Tax Pamphlet—The Bureau of Internal Revenue in line with its policy of seeking to make Federal tax laws and regulations as simple of administration and understanding as their technical character permits, has revised its "Bulletin B," a document designed to explain in non-technical language the application of provisions of law covering the withholding of income tax at the source and to the supplying of information at the source. In making public the revised volume, obtainable upon application, the Bureau claims it has made every effort to translate Regulations 69, dealing with these phases of taxation, into language that the layman can understand. The new bulletin also eliminates certain forms and methods heretofore in use, and simplification is expected to result in this way. The bulletin also brings down to data all rulings and digests under the revenue act of 1926, so that the taxpayer has before him a complete interpretation of the law and its application.

Labeling and Advertising Standardized Goods—The labeling and advertising of standardized goods is recommended as an aid to manufacturers, retailers, wholesalers and consumers alike, in a statement just made public by the American Engineering Standards Committee, through its chairman, Ethelbert Stewart, Commissioner of Labor Statistics, who says that "if goods made in accordance with specifications were more fully advertised as such, both in the press, in catalogs and circulars, and on the labels of the goods, the buying problem of the consumer would be greatly simplified."

Plans for Management Week Progress—Interest in the plans and program for this year's "Management Week," Oct. 24-29, is steadily growing, according to the recent statement of the Department of Commerce. This event is sponsored by technical and professional organizations concerned with securing understanding and intelligent direction of the principles of administration and management which govern business and industrial efficiency.

Each year since 1911, when the movement first started, there has been a decided increase in interest and in its support, by executives, business leaders, engineers, etc. The topic for 1927 is "Management's Part in Maintaining Prosperity," a timely topic because of the high level of prosperity prevailing throughout the United States, and the necessity of consolidating gains made in recent years as a safeguard against recession, business depressions and panics.

Trade Marks—A trade mark may be used for letterheads, billheads, bill forms and blank sheets, says the Commissioner of Patents, overruling a previous rejection for application for a trade mark for such printed matter on the ground that it did not identify goods (No. 209,541), so that if you have an unusual design which you value for your stationery register it with the Patent Office for your exclusive use. On the other hand, a "yellow wheel" is not enough to secure a trade mark registration (ex part W. T. Grant Co.), since it does not possess properties or characteristics of distinctiveness such as to suggest to the average member of the public the idea of ownership or origin, and it was held that the applicant's yellow wheel did not of itself function as a trade mark.

In the Case of the Empire Paper Co. vs. Carew Mfg. Co. (No. 1931), U. S. Court of Appeals, D. C., it was held that an opposer to a trade mark, who entered into a contract with the applicant whereby the applicant was to sell writing paper made by the opposer and use the mark, "Treasury Bond," he was still the prior user and owner of the mark.

The facts in the case show that in May, 1924, the Empire Paper Co. applied for the registration of the trade mark "Treasury Bond" for use as a water mark upon writing paper. Both applicants claimed in this controversy to continuous use since February, 1913, and prior thereto. But the opposer in 1913 entered into an arrangement with the applicant, whereby the latter undertook the sale in the Chicago markets of opposer's paper, which was to bear the special notation "E. P. C. Treasury Bond," the letters EPC being the initials of the applicant's corporate name. Under this arrangement, applicant began and continued to sell opposer's paper in the Chicago trade. The applicant had not made use of such a trade mark prior to this arrangement. Afterwards applicant ceased to buy opposer's products and procured paper from other manufacturers, which also bore the water mark "Treasury Bond."

The examiner of the Patent Office and the Commissioner of Patents on appeal, both held that opposer was the prior user and owner of the mark, and that it did not part with its title thereto because of the transactions between the parties, but merely gave to applicant the right to sell opposer's goods bearing the mark in the Chicago trade. The court found this decision correct and overruled the appeal.

Patent Litigation—In Eibel Process Co. vs. Alexandria Paper Co. (No. 3791), U. S. Circuit Court of Appeals, 9th Cir., because defendant used only one of the two features of a patent, the District Court had ruled there was no infringement, but the upper court reversed this ruling.

In Walter H. Deubener vs. R. Brownson & Co. (No. 7559), U. S. Circuit Court of Appeals, 8th Cir., a patent on a paper bag, being narrow in scope, was held not to be infringed by defendant's different structure.

Paper Exports Increase—The value of shipments of paper and paper products from the United States during the first six months of 1927 valued at $13,866,891, show an aggregate gain of $418,738 over the same period for 1926. Nearly all classes of paper shared in the increased demand on the part of our foreign customers, with fine papers, paper specialties, and board showing proportionately the greatest gains.

British Mark of Origin—The new Merchandise Marks Act of the United Kingdom has a marked effect on the sales of American paper products in that country, and which if neglected, will have serious importance for both importer and exporter, as the new regulation is being enforced with increased strictness, requiring a mark of origin of all countries shipping products into the United Kingdom. A copy of the Merchandise Marks Act may be obtained from the Bureau of Foreign and Domestic Commerce.

More Trade Promotion Offices—The Bureau of Foreign and Domestic Commerce has expanded its foreign trade service by the opening of five additional regional offices in various parts of the country to furnish information concerning foreign trade opportunities, advice in packing, names of desirable agents, economical shipping routes, necessary documents, rates of custom duties, warehouse facilities, and many other details essential to foreign trading.

Pulp Production Increases—There are 76 mills making pulp of both kinds, in operation in Czecho Slovakia, of which 51 are connected directly with paper or board mills, with

actual production of pulp in 1926 of 43,000 tons of air-dry mechanical pulp and 220,000 tons of chemical cellulose. The increase in production during the past 7 years has taken place entirely within the field of chemical pulp, the output of mechanical groundwood having remained practically stationary. Only small quantities of rag pulp and no straw pulp are produced in the country, while the production of chemical pulp is limited almost entirely to sulphite, the larger part of which is sold on the domestic market. Most of the exported pulp goes to Switzerland, France, Italy, the United States, and Germany in order of importance.

Recent I. C. C. Rulings—In Iroquois Pulp & Paper Co. vs. Ann Arbor R. R. Co. (No. 16,389), the Interstate Commerce Commission found that rates on blank wall paper, in carloads, from Thomson, N. Y., to destinations in central territory, were not unreasonable or otherwise unlawful; but that rates on newsprint paper, in carloads, from and to the same points, were unreasonable to the extent that they exceeded the rates on blank wall paper, and reasonable rates were prescribed for the future.

In International Paper Co. vs. Boston & Maine R. R. (No. 16,841), rates on imported wood pulp, in carloads, from Boston to Fort Edward, N. Y., were found unreasonable, reasonable rates prescribed and reparation awarded.

In Practical Drawing Co. vs. Chicago & N. W. Rwy., (No. 18,114), rates on a carload of printing paper from Appleton, Wis., to Dallas, Tex., were found unreasonable and reparation was awarded, while rates on two mixed carloads of printing paper and writing paper from Appleton and Neenah, Wis., to Dallas, were found not unreasonable.

In Western Paper Mawers Chemical Co. vs. Atlantic Coast Line R. R. (No. 19,020), rates on rosin dross, in carloads, from Jacksonville, Fla., to Pensacola, Fla., over an interstate route, were found unreasonable and reparation was awarded.

Rates on printed waxed wrapping paper, in less than carloads, between points in official territory, were found unreasonable in Ward Baking Co. vs Penna. R. R. Co., and reasonable rates were prescribed for the future and reparation awarded.

A lengthy decision is handed down in Kalamazoo Vegetable Parchment Co. vs. Chicago, Kalamazoo & Saginaw Rwy. Co. (No. 17,206), on ratings of waxed wrapping paper, vegetable parchment wrapping paper, and vegetable-parchment paper wrappers, in official, southern and western classifications.

Employment—The following figures show employment and pay-roll totals in paper manufacturing, using 1923 as the basis of 100:

	Employment			Pay-roll totals		
	1926	1927		1926	1927	
	July	June	July	July	June	July
Paper and printing	102.1	102.4	101.8	108.5	111.0	109.0
Paper and pulp	94.9	92.0	92.2	98.3	97.0	95.3
Paper boxes	99.0	94.5	95.0	105.7	102.8	103.8

I. P. Co. to Operate Corner Brook Mill

At the closing session of the Newfoundland Legislature in St. John's on Tuesday, September 6, the agreement with the Government proposed by the International Paper Company of Newfoundland, Ltd., was fully ratified, which means that the Corner Brook plant of the Newfoundland Power and Paper Company passes into the control of the Newfoundland subsidiary of the International Paper Company of New York, which will operate the mill. By the addition of this plant to its Canadian and Newfoundland properties the total newsprint production of the International Paper Company will be increased 800 tons a day, though this figure will not be reached until the Corner Brook plant is operated to capacity, its present output being about 400 tons daily. Total newsprint production by International Paper outside the United States will then approximate 500,000 tons yearly.

The new acquisition gives approximately 90,000 hp. of developed hydro-electric power and valuable timber reserves to which the company will make additions through purchases elsewhere in the Dominion of Newfoundland. It will soon own the bulk of the pulpwood on the island, with the exception of that owned by the Rothermere interests. A further development, and a new mill will be operated at Gander Bay in Bonavista, having a capacity of 200 tons, as a result of the agreement which has just been ratified by the Newfoundland Legislature.

One of the important concessions made to the International Paper Company by the Newfoundland Government and which is now the law of the Dominion by act of the Legislature is that the company is given the right to export pulpwood from Newfoundland to the United States to the extent of half a cord for each ton of paper manufactured on new machines in excess of what is at present being produced. This refers to the operation of the new mill at Gander Bay which is to have a daily output of 200 tons.

Civil Service Exam

The United States Civil Service Commission announces the following open competitive examinations: Vacancy in Bureau of Standards, Dept. of Commerce, for duty at Ames, Iowa, and vacancies occurring in positions requiring similar qualifications, for duty in Washington, D. C., must have application filed with Civil Service Commission at Washington, D. C., not later than Sept. 20. This position as assistant Paper Maker has an entrance salary of $1,500 a year, and a probationary period of six months is required, later advancement depending on individuals ability.

The duties will be to assist in the operation and maintenance of an experimental paper mill of the Bureau of Standards, and competitors will not be required to report for examination at any place, but will be rated on their physical ability, education, training, experience and fitness.

In co-operation with their employer, the employees of the Missiquoi Pulp and Paper Co., Sheldon Springs, Vt., have acquired group life insurance approximating $200,000. The insurance program also includes health and non-occupational accident benefits, and was underwritten by the Metropolitan Life Insurance Co.

Foreign Trade Opportunities

No. 26618—Cardboard for folding boxes and containers, and wrapping, toilet, and transparent papers. London England. Agency desired.

No. 26617—Drinking cups of paraffined paper. Batavia, Java. Agency desired.

No. 26615—Paper and paper goods, including stationery. Frankfort, Germany. Purchase desired.

No. 26630—Toilet paper. Alexandria, Egypt. Agency desired.

No. 26582—Wall board and papers. Glasgow, Scotland. Agency desired.

No. 26801—Cardboard for boxes. Havana, Cuba. Agency desired.

No. 26802—Cardboard, wrapping paper, and paper for covering fancy paper boxes. Leicester, England. Agency desired.

No. 26853—Casein. Antwerp, Belgium. Agency desired.

No. 26857—Rosin. Hamburg, Germany. Agency desired.

No. 26809—Pulp and paper mill machinery. London, England. Agency desired.

No. 26835—Chrome papers and chrome cartons for lithographic work. Havana, Cuba. Purchase desired.

No. 26834—Cardboard boxes and novelty wrapping paper, especially transparent paper. Zurich, Switzerland. Purchase and agency desired.

No. 26796—Rosin, 50 to 100 barrels. Biebrich, Germany. Purchase desired.

No. 26962—Bags and wrapping paper. Panama City, Panama. Agency desired.

No. 26940—Vulcanized fiber. Vienna, Austria. Agency desired.

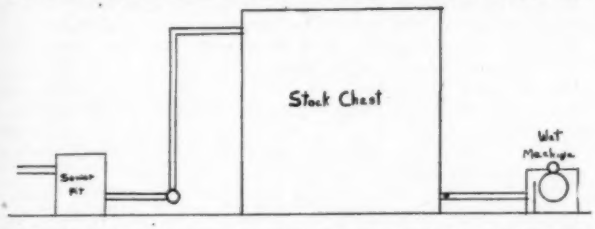
No. 26960—Writing and wrapping paper, printing or stamping paper, cards, and pasteboards. Havana, Cuba. Purchase and agency desired.

No. 26919—Ammonium sulphate and caustic soda. Hamburg, Germany. Agency desired.

Practical Helps for the Mill Man

Stock Losses Through Sewer Recovered

THE superintendent of a roofing felt plant thought that stock losses through the sewer might be minimized through the use of a stock chest or pit and a wet machine both of which were standing idle in another portion of the plant. Therefore, at the lowest point in the sewer line a small concrete sump was built and from which all sewer water was



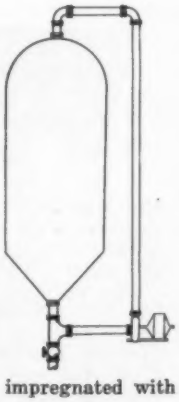
pumped to the chest or pit and thence to the wet machine. The sewer water from the mill held in suspension small amounts of stock received as overflow from a save-all installation, pump leaks, wash ups on wet end of paper machines, scraps of broke or any other stock which might find its way into the sewer from all points in the mill. The pit acting somewhat as a settling tank, permits most of the heavy particles such as metals, buttons, etc., to settle from the fibrous material in suspension in the sewer water, this material flowing to the wet machine. The average saving through the use of this scheme is about six tons of stock per week or a saving of considerable worth.

Stopping Vibration on Balance Scale

A CHEMICAL engineer desirous of making accurate weighings on an analytical balance which was located on a shelf supported by brackets attached to a wall of the mill, found that vibration affected the weighings to such an extent that accurate work could not be done. To eliminate this difficulty, a slab of soapstone 14"x17"x1¼" and four No. 5 rubber stoppers were used to construct a table top upon the top of the original table, the rubber stoppers serving as legs for the new top and absorbing the vibration which caused difficulty on the original stand.

Cooking Old Papers

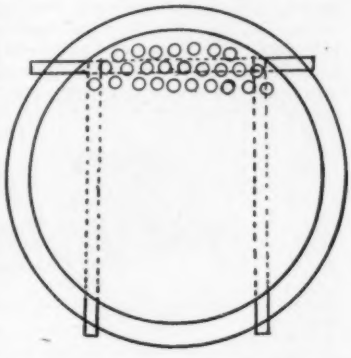
IT IS the conviction of many who make paper from old de-inked stock that the power to circulate the paper pulp while the liquid used is working on the ink can be reduced by eliminating the turning of the cooking vessel or the forced movement of an agitator. This group of papermakers recommends the placing of shredded old papers in a tank together with the necessary liquor. The pulping and the agitation necessary, that the cooking liquor may properly work on the paper stock, is obtained by drawing the pulp out at the bottom of the tank and putting it in at the top. A "T" and valve is provided for dumping the stock when it is properly pulped and impregnated with liquor.



Removing Cover from Horizontal Digester

IN A MITSCHERLICH sulphite mill equipped with horizontal digesters, the superintendent was interested in decreasing the cost of providing a means for permitting the removal of the bottom covers without the pulp stock forcing itself down upon the covers and making their removal difficult. It had been common practice to use a lattice work of wood strips across each one of the openings, these strips being cooked sufficiently during the cooking interval to permit easy removal after a manhole cover had been removed. Such a scheme was expensive since it meant the use of new wood strips for each digester charge.

After some experimentation, it was found practical to use three one-inch brass tubes as cross-bars laid as shown in the accompanying sketch, across the opening of the digester together with an acid proof circular and perforated plate of ⅜ copper of a diameter two inches less than the diameter of the opening over which it was to set. This plate setting upon the three brass tubes supports the chips or pulp stock above the manhole cover and permits an easy removal of the cover at the end of a cook. After the cover has been removed, it is simply necessary for one of the workmen to grasp the tube which supports the other two, as well as the plate, with a long hook and with a pull on the hook thus remove it. This causes the other two tubes together with the plate to drop through the stock opening. Such a plate will last better than a year and has meant material savings in the operation of the digesters.

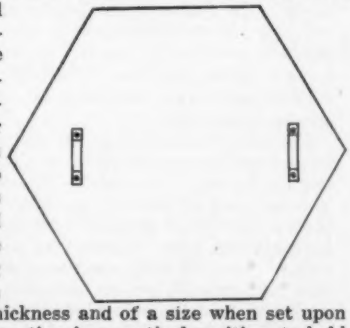


A Lamp for Use When Sewing Wire

EVEN in a well lighted machine room, and especially on the night shift, it is necessary to have some additional light at the point of the crack. Many good papermakers are ruining their eyesight by putting a common incandescent globe, either unshaded or with only a piece of paper thrown over it, down close to the crack. This is very bad illumination as well as being a danger to the eyes. The accompanying sketch shows a lamp devised by a boss machine tender for his own use, and made for him by the millwright. There is a wooden base of fairly generous area. On the bottom of the base is glued a goodly thickness of wet felt to protect the wire. The rest of the stand is of flat iron with a good lamp and reflector. This arrangement is preserving the boss machine tender's sight for his old age and, in addition, giving him proper light without shadows.

Handy Assistant for Gluing Headers

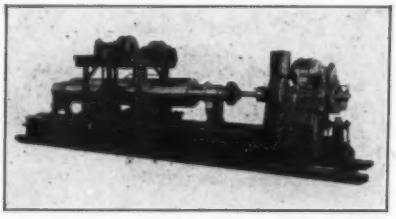
WHEN wrapping rolls of paper in some mills, it is common practice to use an inside and outside header on the ends of the rolls. Sometimes it is difficult to hold the outside header in position until the glue has set, particularly if workmen are hurried. One organization found it advantageous to prepare a number of hexagonal plates from boiler plate steel and to equip them with handles so that a plate could be easily placed on the end of a roll after gluing a header. Each plate was one-fourth inch in thickness and of a size when set upon the end of a roll, the roll resting in a vertical position, to hold the pasted header solidly in position for such period as was necessary.



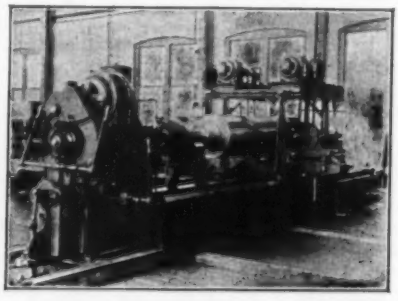
Improved Model of Roll Grinding Machine

The Lobdell Car Wheel Company of Wilmington, Delaware have redesigned their No. 3 roll grinding machine for grinding rolls up to 30 inches diameter. While retaining the well known and time tested principles upon which their machines have always operated so successfully, they have made many changes and refinements, tending to more efficiency in operation, greater rigidity, longer life and increased ease and comfort of the operator.

The new machine is of the same general design as the older model, with a bed of heavy box type with solid bottom and cross ribs, and provision for keeping the V guides true for a life time. The carriage has the exceptionally long Vs which provide the additional wearing surface that has been one of



the contributing factors to the long life of Lobdell grinders. It has been more rigidly designed and has overhanging sides, protecting the V. guides. The wheel slide rests are so constructed that there is always a rigid support directly under the wheel on the carriage. The wheel arbors of hardened



tool steel with ground conical bearings, running in adjustable phosphor bronze boxes with ring oilers are identical with the previous model. The bearings are fully enclosed and protected from grit. The two grinding wheels are each driven by two belts from separate motors mounted overhead on light but rigid frame work carried on the carriage, and are provided with patented balancing rings, insuring a perfectly running wheel.

The driving head shows the most apparent change in design. The new machine is entirely self contained. The drive is by a constant speed motor, operating through a friction clutch and sliding gears, giving three speeds to the roll; the final drive being through herringbone gears. All the driving gears are of steel accurately machined.

There are two feeds for the traverse of the carriage as on previous models, the gearing for which as well as that of the drive is all enclosed in the driving head of the machine and with its bearings is lubricated by a flood of filtered oil from the oil supply system.

The roll is connected to the main drive in the same manner as on previous models using a driving bar with square ends sliding through the hollow square in the driving spindle. The securing of this driving bar for maintaining the longitudinal location of the roll independent of the shoulders of the journals has been improved by use of an ingenious enclosed collar. The chucks for securing the bar to the roll necks have also been refined, having been provided with a special locking device to hold them in place on the driving bar and ingeniously devised set screws for fastening them to the roll necks, eliminating all projecting parts to catch or injure the operator.

The bearings for the roll journals have also been redesigned, incorporating suitable babbitt bearing blocks which are set in the cast iron adjustable blocks for each size of roll journal. Suitable roll stands, adjustable blocks and babbitt bearing blocks or cheek pieces are supplied for roll journals, varying from 1 15/16" diameter to 18" diameter.

The traverse or feed screw is of large diameter with square thread bearing throughout its length on a groove, machined in the bed casting. It takes its strain in tension on ball bearings at each end and runs in a bath of oil which is constantly renewed from the circulating oiling system. The screw and its nut have been more effectively covered by a large inverted channel, and there is absolutely no possibility of water or grit entering the screw well.

The lubricating system consists of a plunger pump, attached to and operated by the driving head, which delivers oil to a filter located at the top of the machine from which it flows, flooding the driving and feed mechanism, the feed screw and the V guides, keeping them thoroughly lubricated at all times. The oil then drains back to a sump in the driving head and thence to the pump again. All secondary bearings are provided with Alemite Zerk fittings. On the same bracket with the oil pump is also mounted the water circulating pump for supplying the soda water to the grinding wheels.

The crowning device which produces a crown of mathematical precision without the usual cut and try method, operates on the same principle that has so largely contributed to the preeminence of Lobdell roll grinding machines. However, it has been made much heavier, giving increased rigidity and has been provided with means for taking up all lost motion, thus eliminating the tension spring of the formal model.

While at present this new design is in the No. 3 size machine only, it is the intension of the company to redesign its two smaller size machines on the new lines in cases where the mills deem it desirable to go to the increased expense of the more elaborate machine. It has also in preparation a larger machine which will accommodate rolls up to 42" diameter.

Morse Chain Announces New Chain Design

An improved chain has been announced by the Morse Chain Company, Ithaca, N. Y., long noted as the manufacturer of the original rocker-joint chain. The improvements are principally due to changes in the design of the rocker joint. The new design, 55 type chain, will run on all sprockets, the new link being the same length and height as the old.

The new, joint, shown herewith, operates on the same principle as the original Morse rocker joint. The seat pin, at the left, has been enlarged to give greater bearing surface and

also to make it a stronger transverse member to hold the chain together.

The rocker pin, at the right, has been changed in contour, thereby giving a better surface of contact with the links.

The combined joint members give a more nearly round hole with reduced clearance, holding the links more securely on the pins. A better balanced joint, heavier than the old, produces a smoother running chain. It is a more rugged chain—the joint pins are about 8 per cent heavier and the complete chain weighs twice the pitch per inch foot. The breaking strength is increased about 50 per cent.

The improved, better balanced joint, with larger bearing surfaces and pins more securely held in the links, permits increased tension without shortening the life of the drive.

The most modern automatic electric furnaces have been recently installed, to insure the more uniform heat treating of the parts entering into the chain.

Philadelphia Gear Works will occupy their new building at Erie Ave., and G. Sts., Philadelphia, after September 1.

Lewis-Shepard Makes New Arc-Welded Steel Platform

Lewis-Shepard Co., manufacturers of jacklifts, stackers, steel frame platforms at Watertown Station, Boston, Mass., announce the establishment of a branch factory at West Bend, Wis., for the manufacture of their new 4-way arc-welded steel frame platforms to supply the Western territories.

Until about six months ago all platforms on the market were either bolted or nailed together. The drilling of holes for bolting naturally weakened the joints. Arc-welding was rapidly coming into prominence for steel construction, and after two and one-half years of experimental work, they succeeded in completing their present design which may be made in either 2-way or 4-way types, according to the desire of the customer. Arc-welding makes a rigid, one-piece frame equal to the full strength of steel.

Brown Hoisting—Industrial Works Merger

A most interesting merger plan has been announced, as that effective between the Brown Hoisting Machinery Co., Cleveland, and Industrial Works, Bay City, Mich., and the approved plans for a merger of the two companies are to be made effective when ratified by their respective stockholders at a meeting in the near future. The physical properties, the earnings, as well as standards of design and workmanship, and the personnel of both companies are most similar, qualifying excellent possibilties as a result of the merger.

The object of consolidation is stated as that of being able to render better service to users of material handling equipment by means of eliminating duplication or overlapping of product where it exists, and by effecting economies in manufacture and concentration in each plant on that portion of the work which can be produced to best advantage.

The Brown Hoisting Machinery Co. was founded in 1880, and Industrial Works was founded in 1873. Brown designs and manufactures hoisting and conveying appliances and heavy machinery of all descriptions including locomotive cranes, grab buckets, combination shovels and cranes, ore unloaders, bridge cranes, gentry and portal cranes, trolleys, hand traveling cranes and conveyor equipment. Industrial Works designs and builds locomotive cranes, wrecking cranes, heavy duty and full revolving pile drivers, crawler cranes and shovels for gasoline, steam, electric or Diesel operation, gentries, pillar cranes, rail saws, buckets and steam hammers. The Brown principal plant occupies nine and one-half acres, while that of Industrial Works occupies twenty-nine acres.

This consolidation will join under one management over 2100 employees and assets of approximately $13,000,000. Both plants will be continued in operation, and no radical changes of any sort are contemplated.

New Subsidiary for Combustion Engineering

George E. Learnard, president of International Combustion Engineering Corp., has announced the acquisition of the Sulzer System for dry quenching coke which will be developed in this country by a new subsidiary, Dry Quenching Equipment Corp.

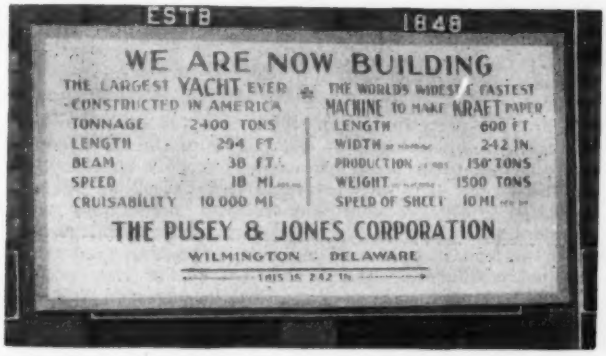
The first unit of this system to be installed in America was for the Rochester Gas and Electric Corp. The Sulzer system is widely used in Europe for cooling coke without the use of water, and steam is produced for power and plant purposes during the cooling process, therefore diverting the heat of the coke to use, which at present is lost by wet quenching.

The directors of the new corporation are: George E. Learnard, chairman; H. D. Savage, president; G. G. G. Hunter, vice president; George H. Hansel, treasurer; Hans Sulzer and F. Oederlin of Winterthur, Switzerland, and E. N. Goodwin of New York City. Walter Sennhauswer, at the present time connected with Sulzer Brothers of Winterthur will come to this country as chief engineer.

A. T. & T. Discloses Interesting Facts

One hundred-seventy million lbs. of paper, lead and copper are used yearly in one plant alone to produce telephone cable required for the Bell Telephone System. This cable is manufactured in two plants—one at Kearney, N. J., and the other at Hawthorne, Ill.

Cable stranding machines at the Hawthorne plant have a capacity of 590 reels of wire and produce over 50 linear ft. of cable per minute. To insulate the cable requires 6000 tons of paper of twenty-three sizes and five different colors. In March, 1926, a record month, the total output was nearly 4 billion feet of wire.



The world's biggest and fastest kraft paper machine and the world's biggest yacht....And the Pusey & Jones Corporation have billboarded the place to tell the world that travels through Wilmington, Deleware all about it.

Keeps Five Jumps Ahead

Defying all so-called rumors that business is dull this year, etc., Trimbey Machine Works of Glens Falls, N. Y., has at present writing sufficient orders ahead to keep the plant busy for five months.

T. A. Gastanguay, installation agent for the firm, has just returned from a seven months trip abroad, where he installed machines in various countries, and it has been said that the business this year amounts to several thousands of dollars, as well as being much larger than that done last year.

September Paperboard Meeting

The next meeting of the Paperboard Industries Association is to be held in Chicago, at the Palmer House, September 21 and 22nd. On September 21 the Paperboard Group meets in the morning, and Folding Box Group in the afternoon. The Container Group Meeting is scheduled for September 22nd, in the morning, and the general meeting of all three groups in the afternoon of the same day.

At this meeting each of the three groups will appoint two members of a Nominating Committee who shall nominate a president to be elected at the November (annual) meeting. Group vice presidents and members of executive committee will also be elected at the November (annual) meeting.

D. A. Crocker, secretary of the Woodlands Section of the American Paper and Pulp Association, and also secretary of the Salesmen's Association of the Pulp and Paper industry, is just back in New York after several weeks' vacation. During his vacation Mr. Crocker attended a meeting of the Woodlands Section of the Canadian Pulp and Paper Association, following which he visited forest holdings of several Canadian pulp and paper companies.

R. S. Kellogg, secretary of the News Print Service Bureau, is back at his desk after an extended trip, which took him to the Pacific Coast, visiting many old and new paper plants.

Book Reviews

Directing Sales (The Executive's Problem) by H. C. Bonney, vice president of the Ruberoid Company. Published by The Ronald Press Co., New York. Price $3.00. A very readable book, this, with no attempt to pigeon-hole the various traits that psychologists would have us use, especially to teach our executives as a hard and fast criterion for the judgment and choice of salesmen. The book gives a good fundamental background of principles that executives would do well to add to their storehouse of information and experience. It is one of the few books that discusses fundamentals of advertising without the usual glamourous veneer, and still exhibits a broad mind behind expression for judicious choice of this publicity medium. It is worth having the book for this section alone.

History of the Incandescent Lamp by John W. Howell and Henry Schroeder. Published by The Maqua Company, Schenactady, N. Y.

Starting with a pithy history of the development of electric lighting prior to Edison's invention, the book takes us through a complete cycle of the history of the incandescent lamp, including the latest processes of modern manufacture, handling, etc. The book contains facts based on the experienced knowledge of two thoroughly qualified to write on the subject, and still possesses enough of the historical touch to lend it color and make it interesting reading as well as informative. The illustrations of the first developments of the lamp are very worthwhile, and all in all this book should make a welcome addition to your library.

The Rayon Industry by Mois H. Avram, Published by D. Van Nostrand Co., New York. Price $10.00.

The brief history of Rayon in the beginning is tabular yet especially informative in its revealing of the industry's early development. The importance and growth of this industry cannot but deeply impress the reader after he has read Avram's second chapter on the development of Rayon to 1926.

An interesting section is that reviewing the common textile fibers, their types, characteristics, and methods of production. The charts and statistics, besides the tables, diagrams and other illustrations, should be especially invaluable and instructive to those technically interested in the study of Rayon.

The alluring feature of the book is its utter comprehensiveness. Rayon is discussed from every possible angle in simple and clear cut style, and the layman can enjoy it as well as the rayon research student.

A special section devoted to patents, patentees, date, and type of patent certainly exhibits the exhaustive research of the author, and his desire to present a complete treatise on that growing and interesting industry "Rayon." It is as clear as a good textbook should be, and as well written as a book for pure reading should be.

Catalogues, Booklets, Etc.

American Blower Co., Detroit—Their new booklet, entitled "Collecting Fly-Ash and Coal Dust," consists of only 10 pages, but contains a wealth of data, dimensions, etc., plus diagrams, illustrations, and concise explanations.

Crandall Packing Co., Palmyra, N. Y.—Catalog No. 10 is a very lucid piece of work on the subject of "Packings"—Crandall packings in particular, but also containing a very good array of material on the different types of packings. This booklet is well illustrated, and contains plenty of packing data for the man who is interested.

Hauser-Stander Tank Co., Cincinnati, O.—"Wooden Tanks for Every Purpose" is a fine treatise on tanks, together with some very comprehensive charts and tables on dimensions and capacities of tanks. Of particular interest to our readers, should be the contribution in this booklet by S. J. Hauser and Clarence Bahlman, entitled, "A Study of the Action Various Chemicals Upon Different Woods Used for Chemical Tanks" Anyone who is interested or has any question in mind about wooden tanks should write for this book.

National Research Council, Washington, D. C.—"Industrial Research Laboratories of the United States, including Consulting Research Laboratories," is the latest booklet giving the data on those centers of research that are invaluable to the research student and worker.

Philadelphia Quartz Co., Philadelphia.—A comprehensive treatise on the use of silicates of soda in various kinds of cements has come to us in the form of a booklet entitled, "Silicate of Soda Cements." Page 12 contains the especially interesting story of Digester Linings, together with the formula used for lining sulphite digesters.

Webster Mfg. Co., Chicago.—Their complete line of chain and sprockets are shown in Catalogues No. 46 and 48, which has just been revised. Latest price lists and description of chain and sprockets in effect July 1, are contained in chain catalogue No. 50.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—Circular 1579-E is a new publication on micarta gears and pinions, and contains the latest authentic data and technical information relative to the manufacture, design, and form of construction of micarta gears and pinions. In addition to the general and technical information is a new formula and tables, based on the recommended practice of the American Gear Manufacturers Association.

Rue Leaves Forest Products Lab

J. D. Rue, chief of the U. S. Forest Products Laboratory's pulp and paper section, Madison, Wis., plans to leave September 15 to accept position as director of research for the Champion Fibre Co., Canton, N. C.

He has been in charge of the pulp and paper section at the laboratory in Madison since 1921, and under his direction many successful pieces of research have been carried out. Before joining the Forest Products Laboratory, he was assistant to the president of the Mead Research Corp.

James H. Wright

James H. Wright, Sr., age 59, and for eight years an official of the Bryant Paper Co., died suddenly at his home on August 24, following a heart attack.

Mr. Wright came to Kalamazoo from Wisconsin Rapids in 1924, and entered the Bryant mill as assistant to the late Frank H. Milham, president of the company. Later he was made head of the purchasing department. He resigned from that position in March, 1922, to become sales representative for a number of mill supply concerns in the territory.

He was born in Oshkosh, Wis., 1868, and was connected with the Kimberly-Clark Paper Co., for twenty years, later becoming associated with the Consolidated Water Power and Paper Co., where he was an official of that company up to the time he came to Kalamazoo. He is survived by his wife, a son, James Wright, Jr., of New York, and two sisters, Mrs. P. D. Lawson of Menasha, Wis., and Mrs. W. O. Brown, of San Diego, Cal.

A meeting of the General Carton Packaging Committee which is made up of both paper manufacturers and merchants will be held at the Congress Hotel, Chicago, on Monday, October 24. The committee will have before it further reports on investigation of the use of fiber cartons for the shipment of various grades of paper. The chairman of the committee is Kimberly Stuart, of the Neenah Paper Company, Neenah, Wis., and the secretary is Hugh P. Baker, of the American Paper and Pulp Association.

A delegation of English China Clay producers arrived on this side August 26th aboard the S. S. Berengaria. They are visiting the important interests here with reference to existing trade conditions and to ascertain more accurately the requirements of the China Clay consumers.

E. E. Holdman, vice president of General Naval Stores Co., Inc., N. Y., sailed recently on his annual trip abroad to visit England and other countries of Central Europe before returning late in October to the United States.

NEW ENGLAND NEWS

American Writing News

Resuming its position as a leader in the country's fine paper industry, the American Writing Paper Co. is now attracting the attention of the country's financial experts, who see a splendid future and are bullish on its securities. It will be recalled that prior to the reorganization of the American Writing Paper Co., the preferred and common stocks had sunk to purely nominal levels of about $1 per share or less. So far this year the preferred stock of the new Company has advanced from 25.75 to 57.25 and the common from a low of 9.87 to about 23 at this writing. And the present prices are the high points in the current movement indicating that further advances are far from being out of the question. The bonds on which interest is being paid regularly have advanced from 83 to 93.

What this means to those stockholders who paid assessments can be quickly visualized. Common stockholders were assessed $5 per share and received $500 in bonds for every $1,000 paid in, five shares of common and 50 shares of preferred. Preferred stockholders paid $10 per share and received $500 in bonds, five shares of preferred and 60 of common. The value of the common stockholders' holdings on the basis of $1,000 paid in is about $1,850 and the preferred stockholders own securities worth $2,070 on the same basis. The turnover in the stock has been substantial and is growing and the 8½ of assets to 1 of liabilities has made a deep impression on the "Street."

Meantime the official ending of the receivership of the American Writing Paper Co. came on August 29, when Judge Lowell accepted Mr. Willson's final report to which no objections were made. This took place in the Federal District Court at Boston.

Carton Gaining Ground

Before the New England paper trade at the present time the carton idea is gaining ground though it has many enemies. This proposition which has been sanctioned by the National Paper Trade Association, envisages the packing of many less case quantities in cartons, the idea being to stop the practice of breaking up case lots.

That paper cartons are entirely satisfactory for this purpose when made by leading fibre board manufacturers is amply demonstrated but whether the idea would not necessitate larger stocks on the part of the merchant is common talk in the trade.

At any rate the mills are taking much interest in what attitude the merchants take and the whole situation will be thoroughly canvassed at the first meeting of the 1927-28 season of the New England Paper Merchants Association which will gather at the Harvard Club of Boston on the evening of September 12.

Improvements at Strathmore Paper

It is reliably reported that extensive improvements are being undertaken at the mills of the Strathmore Paper Co., in Mittineague, Mass. The No. 1 mill is the subject of these extensions.

Changes are being made in the paper machines and additional equipment installed for greater efficiency and increased production. For a short time during August the mill was closed when this work was at its height but it was reopened quickly as the Company has many orders demanding constant production.

To Convert Manchester Mill

It develops that the report out early last month relative to the establishment of a new company at Manchester, Conn., referred to the proposition of President William P. McCorkindale of the Macco Manufacturing Co., Holyoke converters, who proposed to convert the Oakland mill of the A. W. P. Co., at Manchester, Conn., into a plant for making paper napkins. Mr. McCorkindale has developed a process which he is understood to have patented. He proposed to form a new company and invited the participation of local capital.

President S. L. Willson of the American Writing Paper Co., was sufficiently interested in the idea to propose taking $35,000 of payment for the property in the form of preferred stock in the new enterprise. This mill along with several in and near Holyoke are among those listed for sale. They have been segregated into what is known as the Choral Properties, Inc., a subsidiary corporation.

The price asked for the Oakland mill was $110,000. Unfortunately reports adverse to the appraised value of the property were spread in Manchester and a meeting with the local Chamber of Commerce has not up to this time succeeded in bringing out the necessary capital despite the A. W. P. Co., tacit support. The replacement value of the paper machine alone is said to be around $110,000 and the plant exclusive of machinery is worth around $50,000.

Court to Choose Berkshire Paper Receiver

A hearing on September 7, in the Superior Court at Boston, will hear further arguments against the continuance of Henry W. Harrington, president of the Berkshire Hills Paper Co., as receiver of that corporation. A hearing held during August developed so much antagonism on the part of creditors and an evident desire to wind up the Company's affairs that Judge Sisk has decided to grant ample time for presentation of these arguments. The hearings are expected to last several days. The Company claims assets of $1,250,000 but it has one mortgage of $564,000 alone. Its merchandise creditors hold claims totaling $359,000.

Bradford Mill Supply Sues

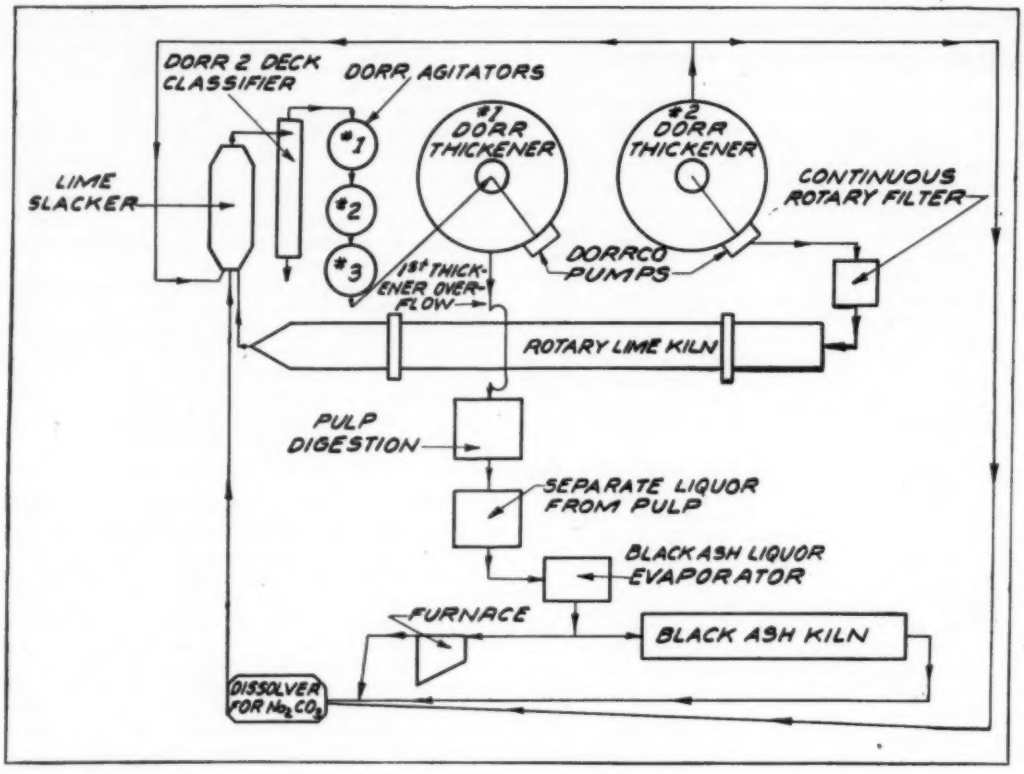
One of the most interesting court actions in months was started during August by the Bradford Mill Supply Co., of Bradford, near Haverhill, Mass., dealer in waste paper, etc. This concern, represented by its chief owner, W. F. Barrett, an attorney, has entered suit in the Superior Court at Salem, Mass., naming the Paper Industries Association, Robert Gair Co., Chemical Paper Mfg. Co., and Bird & Son among others. All these have filed answers.

The plaintiff alleged that Bird and Haverhill division of Robert Gair Co., had boycotted him because of expressed opinions about the activities of the Association. He seeks an injunction against the alleged boycott and apparently a restraining order against the Association. He alleges that Bird and Haverhill divide the New England market, insofar as purchases are concerned, between them, Bird buying south and Haverhill north of Boston. This is done, he stated, to regulate the price of waste paper.

All the companies enter vigorous denials supported by plenty of evidence. Both Bird and Haverhill point out clearly the impossibility of buying waste paper in territory contiguous to another mill providing that mill is constantly in the market. All enter proof of independent action without a trace of collusion. The case is being continued.

It is interesting to remind the trade of the "Paper Salesman" published for the help of the paper salesman, manufacturing and merchant, by the Charles H. Barr Associates of Holyoke through sponsorship of the following mills: Advertisers Paper Mills, American Writing Paper Co., Crocker McElwain Co., Eastern Mfg. Co., Hampden Glazed Paper & Card Co., Holyoke Card & Paper Co. and Millers Falls Paper Co. It is meant to stimulate, encourage and educate paper salesmen.

Rice Barton & Fales Co. are 90 years in business with the passing of September. The Company was started in 1837 as "Howe & Goddard" and was incorporated 60 years ago. It has made paper machinery for almost every large paper



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The Dorr Continuous Recausticizing System eliminates many troublesome operations that are inherent to batch methods. It offers, moreover, the additional advantages of uniformity of results, and of savings in floor space, labor and upkeep costs.

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INVESTIGATION TESTS DESIGN EQUIPMENT

making center in the world and prides itself on the range of its product, paper machines for producing the finest writing paper and machines for turning out quantities of kraft and newsprint said to be among the largest on record.

"Directory of Artists" Unique

Tileston & Hollingsworth Co. have done a bit of clever advertising with their Milton Cover and Text paper. They have prepared a "Directory of Artists" for paper buyers in New England, showing in an attractively prepared and bound book the work that is done by a dozen leading New England artists against a background of Milton text.

It is suggested that printers can on need refer to the Directory for ideas as well as for reference. Each artist is distinguished by ability in some division of his work and this the Directory very handsomely discloses.

Fraser to Build New Plant

It is reported on good authority at Bangor, Me., that the Fraser Companies, Ltd., have broken ground for an addition to their .big printing paper mill at Madawaska, Me. This mill is unique in that it receives its pulp in liquid form in pipe lines from over the River which is the international boundary between Maine and New Brunswick, the pulp mill being located on the opposite bank.

This obviates both the duty on paper and the possible export embargo or duty on pulpwood in Canada.

The report from Bangor alleges that the new plant at Madawaska will cost upwards of two millions and owing to the sold up position of the company's present production, will be rushed to completion. A large force of labor has been recruited from New England and Canadian cities for that purpose.

The recently chartered Keyes Fibre Co., Inc., succeeding the old company of that name, is offering its convertible Class A stock on the market at $42 per share with $3 dividends. The company results from the purchase of the old Keyes Fibre Co., the world's largest manufacturer of pulp pie plates, and its merger with the Rex Pulp Products Co., who are to make the same and other moulded pulp products at the Bath plant acquired by a syndicate including the Central Maine Power Co.

Morart Paper Co., Inc., has been chartered under Massachusetts laws. Its plane of business is Holyoke and it is to deal in and manufacture paper products. Incorporators are Maurice J. Moriarty, president, Charles H. Barr, treasurer. Capital is $25,000.

Selling its vast power resources was something of a problem to International Paper Co. However they have acquired the largest single interest in New England Power Co., and through individual stockholders in both companies wield a very powerful influence which should enable them to find markets for their many power potential power sites.

Freight Decisions

The New England Freight Association has announced definitely that the increased carload minimum of 60,000 pounds will go into effect September 15 on waste paper shipments to Fitchburg, West Fitchburg, West Groton, North Leominster and Wachusett. The rate will apply both on import and shipments originating in Boston. It is an increase from 20,000 pounds per car and means that the railroad must furnish 50 foot cars if the paper is to be loaded to that extent. It would be impossible to load 36 foot cars to that weight.

Moreover the loading of imported stock is performed by the carriers who can hardly hold shippers or consignees responsible for their own inability to load up to standards they themselves establish. The rate under the new minimum is 9½c per 100 pounds but we understand that shippers have the alternative of loading on the old basis at the higher rate.

Census Reports on Paper Products

A proposed new form for the compilation of census data for converted paper products has been submitted to the American Paper and Pulp Association by the Department of Commerce.

The Committee on Statistical Procedure for the Paper Industry, of which C. B. Morgan, treasurer, S. D. Warren Company, Boston, is chairman, and Paul S. Hanway, statistician, American Paper and Pulp Association, is secretary, has met several times and a tentative schedule was submitted to Washington. On July 30, M. C. Dobrow, assistant secretary, Writing Paper Manufacturers Association, and Mr. Hanway met with Messrs. Matthews, Daly, Rolle, Meese and Schnitman, of the Department of Commerce, to discuss changes in the Paper and Woodpulp Schedules for 1927. Practically all the recommendations of the committee were adopted.

Since then, the department has shown its entire willingness to co-operate with the paper industry by offering a separate schedule of converted paper products to include about forty items of major importance selected on a basis of the annual value of the product.

The value of such a schedule in determining distribution of primary production of paper cannot be overestimated.

It not only will show the tonnage of paper going into conversion, but will help to simplify the study of body stock distribution by grades. At the same time, the data will ultimately help to predetermine trends of consumption for certain grades of woodpulp.

In addition to this schedule, the Census Bureau has under consideration an annual abbreviated census of production, shipments, capacity, etc., for paper and for wood pulp.

Such schedules would obviate the present necessity for waiting two years for a report which when issued is more than a year old and its value reduced to a matter of record.

The changes which the statistical committee recommended and which were pressed by Mr. Dobrow and Mr. Hanway were considered as essential in use for research by the paper industry.

Up to the present there has been a mass of generalization which made a tie-up for specific use rather difficult.

Certain of the affiliated associations as well as the American Paper and Pulp Association have been endeavoring to collect statistics in more detail and promptness so that lines of research beneficial to the industry could be undertaken. Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association has offered the co-operation of the association and its staff to the industry and to all associations touching the paper industry in any way. Many associations have taken advantage of this offer and as a result, the American Paper and Pulp Association is fulfilling an obligation in establishing closer and more helpful contacts with its members and the affiliated associations.

As this work advances, and the statistical department of the association develops, it is expected and planned that the value of the association's work along this particular line will be even more beneficial to its members.

Greater co-operation on the part of the mills in furnishing data accurately and promptly would be helpful and Mr. Hanway, statistician of the A. P. & P. A., hopes that the mills reporting will use every effort in mailing early the statistical reports to the association.

President of Industrial Works Dies

Ernest B. Perry, president of the Industrial Works, Bay City, Mich., passed away August 7, after an illness of one week. Mr. Perry was a director of the First National and Bay County Savings Banks, and well known throughout the nation through his long association with the Industrial Works.

Coming to the organization as chief engineer in 1889, he remained with the company and helped build it up to its present size. He became president of the organization in 1924, and remained in that capacity until his death.

The Earle Gear & Machine Co., with main office and plant at 4707 Stenton Ave., Philadelphia, Pa., announces the opening of a New York district office at 95 Liberty St., N. Y. C. with C. N. Walsh and George E. Barrett in charge.

Hold Down Sizing Costs With Quality Rosin Size

TWO factors oppose each other in sizing operations. Results must be highly satisfactory and a naturally costly process must be kept within economical limits.

Kalbfleisch Rosin size squarely meets this situation. It is a quality size first and last . . . noted for cleanness and uniformity, so requisite for excellent sizing results at a consistent cost.

Another advantage may be secured with Kalbfleisch Rosin Size. It is the DeCew Sizing System, which has proved its ability to multiply the efficiency of sizing operations. Kalbfleisch Rosin Size is sold with or without System.

Kalbfleisch is headquarters for dependable paper chemicals

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Canadian News

Check Expansion of Newsprint Industry

It is understood that the provincial Governments of both Quebec and Ontario will shortly take joint action to prevent the overproduction of newsprint and the too rapid increase in the number of pulp and paper mills, with the twofold object of maintaining the general stability of the industry and of ensuring conservation of raw materials and the economic use of the spruce stands, still to be exploited.

Intimation that some action along this line would be taken by the Ontario Government was made by Hon. William Finlayson, Minister of Lands and Forests, at the annual meeting of the Canadian Lumbermen's Association, last winter. It is also learned that Premier Ferguson of Ontario has discussed the possibility of joint action with Premier L. A. Taschereau of Quebec, and that Hon. Wm. Finlayson had a similar discussion with Hon. Honore Mercier, Minister of Lands and Forests for Quebec. The Quebec authorities are understood to be in complete agreement with the Ontario administration.

Paper Bill Passes Newfoundland House

The Lower House of the Newfoundland Legislature passed without amendment or division the Government bill which will enable International Paper to begin extensive operations in the Island. By the proposed agreement, International Paper will take over and operate the property belonging to the Newfoundland Power and Paper Co., at Corner Brook, the capacity of which is to be increased to 600 tons a day by 1933 and will construct and operate a 200-ton newsprint mill in the Gander Valley. The company's request for 4,000 square miles of timber lands in Labrador was disallowed. (Complete announcement on another page.)

The bills have been sent to the Upper House; and after final ratification of the agreement the properties will be taken over by International Paper Co. of Newfoundland, a subsidiary of International Paper Co., which was recently incorporated with a capital of $25,000,000.

W. C. Wines, mechanical advisor to the American Newspaper Publishers, Association, recently met Dr. J. S. Bates and Mr. O. F. Bryant, of the Research Section of the Canadian Pulp and Paper Association, with regard to opacity of newsprint and the general problem of the striking through of printing ink. It was felt that this matter was largely a question of ink quality, and it was decided to ask the Bureau of Standards, at Washington, to undertake an investigation of the problem.

Edward Beck, secretary of the Canadian Pulp and Paper Association, recently discussed the co-operative arrangement between the Association and the Dominion Government with respect to the work of the pulp and paper division of the Forest Products Laboratories, with E. H. Finlayson, director of the Forestry Branch of the Department of the Interior.

At a meeting of the Research Section of the Canadian Pulp and Paper Association held in Montreal last month, plans, were made for the ceremony of laying the corner stone of the Cellulose Institute, now under construction on the McGill University campus, which will take place during the first week of October.

Hon. H. E. Pratten, Australian Minister of Trade and Commerce, was in Ottawa recently, where he conferred with cabinet ministers concerning matters affecting the Canadian-Australian trade treaty. There is considerable disappointment in Australia over the way things have turned out, and Premier Bruce, during his visit to this country, hinted that if Canada did not become a better customer of Australia, that country might seek modification or abrogation of treaty. The agreement has been particularly advantageous to the Canadian Newsprint mills (especially those on the Pacific Coast), who can now compete on equal terms with the English newsprint mills, while newsprint from other countries pays a duty of 3 pounds sterling per ton.

The Canadian Pulp and Paper Association will continue the arrangement entered into with the Dominion Government for the joint operation and control of the Pulp and Paper Division of the Forest Products Laboratories. The arrangement came into force in 1925 for a trial period of two years with three years additional at the option of the Association. The amount involved is $20,000 a year for each of the three succeeding years.

On September 22nd the hearing of some five or six separate, but inter-related, applications arising out of the publishing business, will commence before the Tariff Board at Ottawa. The most important of these, so far as scope is concerned, is the application of Geo. F. Chipman, editor of the Grain Growers' Guide, Winnipeg, for the removal of the tariff and sales tax on material supplies and paper entering into the production of magazines in Canada.

QUEBEC

Price Bros. and Port Alfred Negotiating

In order to better their position, Quebec Pulp and Paper Co. (formerly Chicoutimi Pulp Co.) applied to the Quebec Government some time ago for additional pulpwood limits so as to enable them to construct a paper mill, thus affording an outlet for their groundwood which they are experiencing considerable difficulty in disposing of at a profit. Objections to this move are said to have been raised by other newsprint interests, including Price Bros., and the clash between the two groups of interests was characterized as the most serious which had ever occurred in Quebec.

A solution was found, however, by Price Bros., and Port Alfred Pulp and Paper Corp., offering to jointly purchase the Quebec Pulp and Paper Mills. The offer has been approved of by the Board of Directors of the latter company, and will be submitted to the shareholders at a meeting to be called at an early date. The company owns important timber limits in the Peribonka region of northeastern Quebec, which it would be advantageous for Port Alfred to acquire.

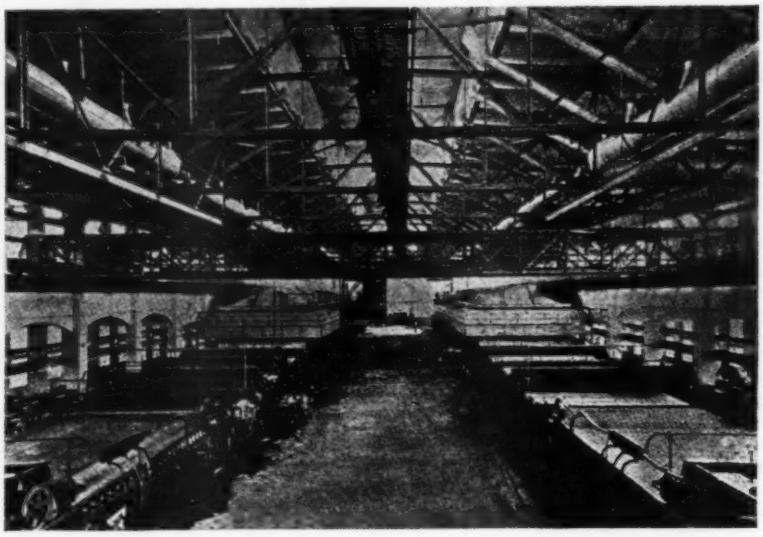
Anglo-Canadian Pulp and Paper Mills have received another heavy shipment of paper mill machinery from Manchester, England, and are proceeding to install it. Construction is progressing very rapidly. It is expected that all the buildings will be completed by the end of September and that the mill will be producing paper by the end of October.

Laurentide Makes Satisfactory Showing

In view of conditions that prevailed in the newsprint industry during the past year, the recently published annual report of the Laurentide Co. for the fiscal year ended June 30 may be considered as very satisfactory. Operating profits are shown only slightly lower, with dividends earned on the capital stock by a small margin. Net profit for the period was equal to 6.06 per cent on the outstanding capital stock as compared with 6.6 per cent in each of the two preceeding years. Net working capital shows a reduction of nearly $2,000,000 over the preceeding report.

"The Powell River Engineers Can Well Be Proud Of Their Job"

From article in July PACIFIC PULP & PAPER INDUSTRY Describing New Powell River Machine Room shown in photograph at left.



The New Powell River Addition as Well as the Original Machine Room Is Equipped with

Briner Economizer

Licensed Under Patents of E. A. Briner and John E. Alexander

and Ross Vapor Absorption System

The installation of Ross heating and ventilating apparatus in this splendid new addition is directly in keeping with the careful economies that are effected throughout the whole Powell River mill. Another piece of convincing proof that where waste is prevented—Ross equipment is on the job. Most every mill can cut steam costs by reclaiming and utilizing the heat units in waste vapor from the machine.

If you are planning to trim operating costs in your mill this winter—preparations should be made now. Consult our engineers. No obligation.

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ROSS ENGINEERING OF CANADA, Limited
NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS
HEATING—VENTILATING—DRYING

In his remarks to shareholders President Chahoon stated that the mills operated during the year with a curtailed production and the contract price for newsprint had been lower. He also stated that the company had acquired full ownership of the Menjobagues Lumber Co., and purchased the Perthuis Seigniory, thus materially increasing its timber resources.

Developments by the group of British capitalists headed by LordGainsford and Sir George Courthope, who came here last May to study conditions in the Lake St. John district, may be expected this fall, according to Hon. Adelard Turgeon, Speaker of the Legislative Assembly and one of the Canadian members of the syndicate, who added that there were unavoidable delays before real work could commence.

The Shawinigan Water and Power Co.'s new transmission line from Ile Maligne to Quebec is completed: about 45,000 horse power is now being delivered, and in a year or so it is expected that the full 100,000 horse power which Shawinigan will take from the Duke-Price Power Co. will be coming up through the cables. This is the longest transmission line in the province, being 130 miles long. A considerable portion of the power will be used by the Anglo-Canadian and Ste. Anne paper mills, at Quebec and Beaupre, respectively.

Lands on the upper St. John River, which, in past years had been the scene of lumbering operations in the Province of Quebec, the logs from which were driven down the St. John River, are being surveyed from the air to secure information for the Provincial Department of Lands and Forests of Quebec.

Carl Skioldebrand, who has been sulphite superintendent for E. B. Eddy Co., Ltd., Hull, for the last couple of years, has resigned and has gone on a visit to his former home in Sweden for a month or two, at the same time inspecting the mills there. On his return towards the end of October he will be ready to consider another connection.

Sale of Timber in Autumn

Several thousand square miles of fine forest lands on the north shore of the St. Lawrence below the city of Quebec will be offered at public auction by the Province during the course of the coming autumn. The conditions of the sale will follow the procedure adopted by the Government of late years, namely, that only 80 per cent of the annual growth may be cut each year.

It is through such conditions that the Government hopes to perpetuate the forests of the province. Arrangements are also being made for the sale of a number of small blocks of forests in the Abitibi region. The policy of the Government will follow the program laid down by the legislature last session, namely, that the time has come to provide supplies for the mills in existence and those projected and approved of, rather than to encourage the construction of new mills which in a few years would find themselves unable to carry on and would also have the effect of harming the existing companies.

The Charlemagne Towing Co., has been incorporated, with head office in Montreal and with power to carry on in all its branches a lumber, timber and pulpwood business, as well as logging operations, contracting, towing, dredging, etc. Francis G. Bush, Montreal, is one of the provisional directors.

The Murray Bay Paper Co., Ltd., has been granted a provincial charter, with head office in Montreal, to carry on the business of manufacturing and dealing in mechanical and sulphite pulp, wood and wood products, etc., as well as to make and deal in paper, cardboard and straw board.

D. E. Read, formerly chemist with the Brompton Pulp and Paper Co., at East Angus, has gone to Camas, Washington, where he has accepted the position of superintendent of the sulphite mill of the Crown Willamette Paper Co. Mr. Read

Bristol Pyrometers Save Sulphur By Directing Burner Temperatures

When making sulphurous acids, for use in sulphite digester cooks, a saving in sulphur will result if a careful check is kept on burning temperatures, and the proper degree maintained for good combustion.

Such a check can be secured very efficiently from the continuous temperature records provided by Bristol's Recording Pyrometers. Glancing at the records occasionally shows exactly how temperatures are, and have been running, thus cutting down the danger of under-and over-heating, and insuring a consistently uniform quality acid.

Bristol Pyrometers combine an extremely fine sensitiveness to temperature changes with a general ruggedness of construction; and have an excellent reputation throughout the pulp paper industry for "standing up" with maintained accuracy under the most adverse conditions.

Write for complete information.

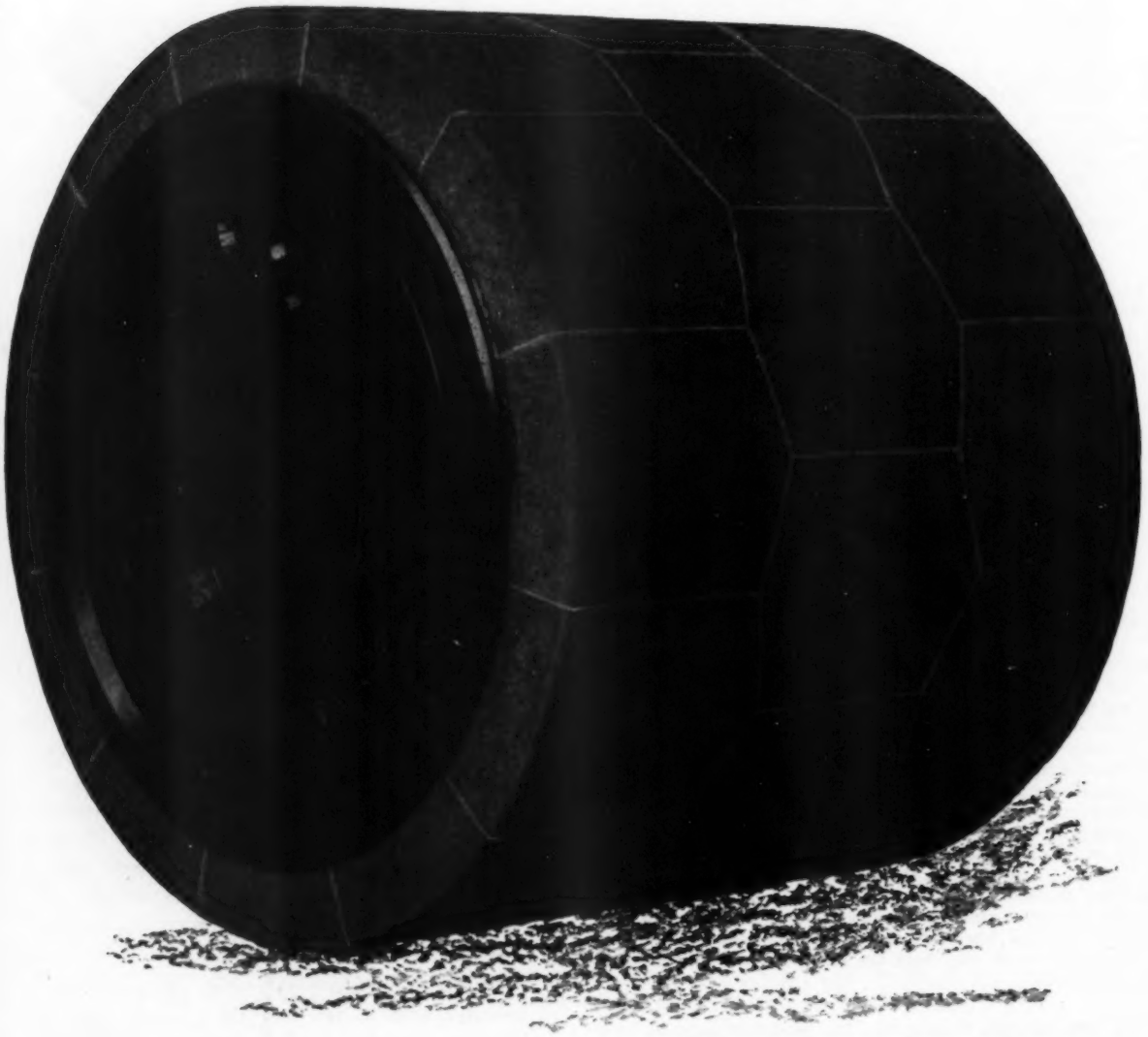
The Bristol Company Waterbury, Connecticut

FOR 38 YEARS MAKERS OF

BRISTOL'S RECORDING INSTRUMENTS

Unlimited Supply

Norton Pulp Stones can be made in quantities to meet all demands



NORTON COMPANY, WORCESTER, MASS., U. S. A.
Norton Company of Canada, Limited, Hamilton, Ontario

NORTON
PULP STONES

is a member of the Council of the Technical Section of the Canadian Pulp and Paper Association.

A. I. MacNaughton, formerly with the Howard Smith Paper Mills as engineer has severed his conection with this firm and entered the employ of Canada Paper Co., Windsor Mills.

A. E. Cadman, assistant secretary and statistician of the Canadian Pulp and Paper Association, recently returned to Montreal after a combined business and pleasure trip to England and the Continent, with the object of making personal contact with the various Associations with which the Pulp and Paper Association is in communication on trade matters.

Anticosti Corporation Has Visitors

Last month a party of Canadian financiers and prominent business men made a 267 miles cruise around the Island of Anticosti, as the guests of the Anticosti Corporation, which purchased the island from Senator Menier, of France.

According to President Geo. McKee, about 100,000 cords were cut on the island last winter, of which 90,000 cords were being shipped this summer to Port Alfred and Three-Rivers. It is intended to double the cut next winter. It is understood there is no intention of building a paper mill on the property, neither is the company considering the possibility of developing the water powers available.

The entire sulphite pulp production of the Port Alfred Pulp and Paper Corporation, which is 100 tons per day in excess of the requirements of the news-print mill, has been sold for the balance of 1927.

Canipco News

A contract has been awarded to an Ottawa firm for the erection of twenty-five brick houses at West Templeton as the first of some 200 houses to be built there by the Canadian International Paper adjoining the Gatineau paper mill. The houses are to be sold to the employees by the company.

Heavy rains during the summer resulted in a considerable rise of the Gatineau River between the Bitobi storage dam and the power site at Paugan Falls, necessitating the postponement of certain portions of the low-lying construction work. In spite of this setback, rapid progress is being made.

Preliminary plans are under way for the construction of a $100,000 saw mill at Rockland, Ont., to replace the one recently destroyed by fire.

Notice has been given to the Provincial Department of Lands and Forests that the company intends to apply for authorization to build a dam to facilitate log driving on Dufault Creek, township of Dufresnoy, county of Abitibi.

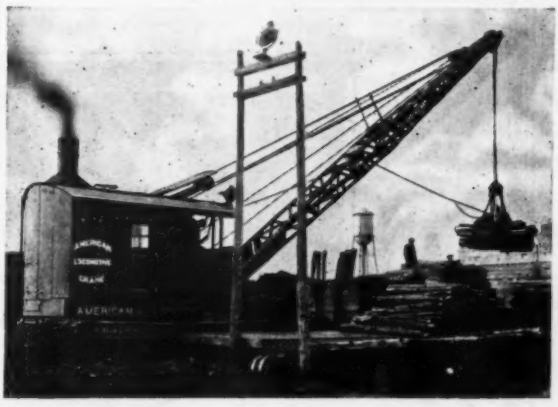
The Gatineau mill shares with the Montreal Harbour Commission elevators and the Quenston plant of the Hydro-Electric Power Commission of Ontario the distinction of having as many Alemite high pressure lubrication fittings under one roof as would be found on all the automobiles in a city the size of Ottawa.

ONTARIO

Investigate China Clay Deposit

Of interest to the coated paper industry is the announcement that the Provincial Department of Mines will this fall conduct a thorough examination and test of the quantity, quality and commercial value of the china clay deposits in the Mattagami River district.

R. B. Harkness, Gas Commissioner for the Province, will have charge of the investigations, which are to be made in conjunction with similar operations by the Douglas interests of Toronto, who have extensive holdings in that territory.



An "American" Locomotive Crane Should Pay for Itself in from 2 to 3 Years

An "AMERICAN" Locomotive Crane in use at the average paper or pulp mill should pay back its cost in from 2 to 3 years. In addition to unloading, piling and rehandling all pulp wood it will find time to unload coal with a clamshell bucket and do all the miscellaneous heavy handling that comes up.

Its ability to switch cars is an especially valuable and money-saving feature. The "AMERICAN" Automobile Type Transmission insures smooth, powerful traveling even over bad track. The traveling gears are all enclosed in cast steel gear cases to keep out dirt and grit. Gears run in a bath of oil.

The "AMERICAN" Locomotive Crane is so accurate and easily controlled that with its 50-foot boom it can pile three tiers of 8-foot wood on each side of the track to a height of 30 feet and as straight as if piled by hand.

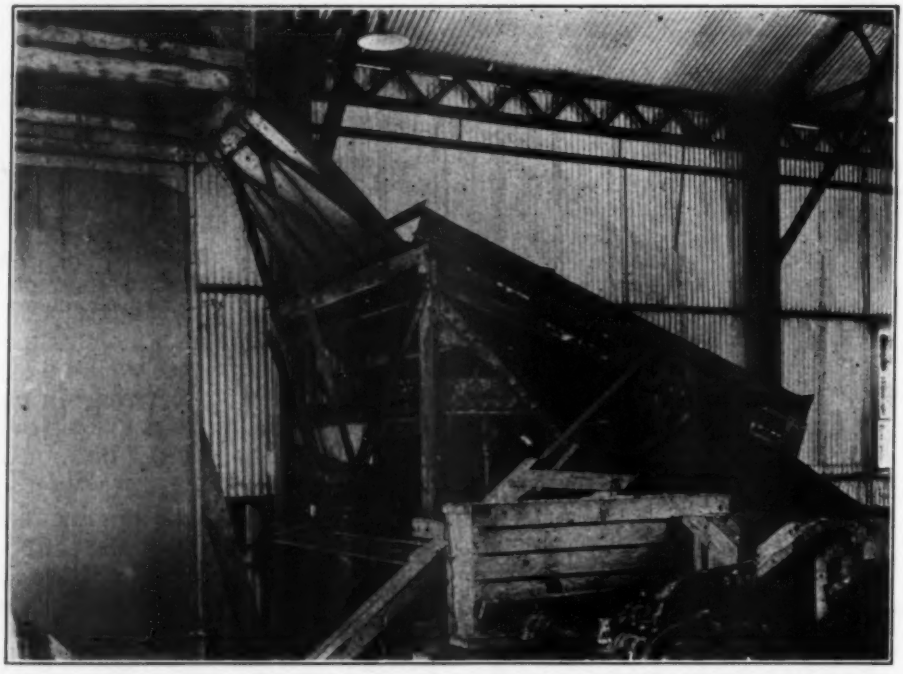
The crane shown above is one of two "AMERICANS" in use at the plant of the Wausau Sulphate Paper Co. at Mosinee, Wisconsin.

Ask for the "AMERICAN" Locomotive Crane Book and the "Five Star Points" Booklet.

AMERICAN HOIST & DERRICK CO.
Saint Paul, Minn.
New York, Chicago, Pittsburgh, Seattle, St. Louis, New Orleans.

RYTHER AND PRINGLE COMPANY
CARTHAGE N.Y.

RYTHER CHIP SCREEN



INSTALLED IN WOOD ROOM OF 40 TON SODA MILL

CLOSED SYSTEM WITH CRUSHED REJECTS RETURNING TO ELEVATOR

CAPACITY—12 CORDS PER HOUR **2-HORSE POWER**

FOR CANADA REFER

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

W. H. Kraske, who has been sulphite superintendent of the Spruce Falls Pulp and Paper Co., at Kapuskasing, for about four years, has resigned and will take a vacation for a time at Wisconsin Rapids, his former home.

Work is progressing satisfactorily on the new paper mill of the Spruce Falls Pulp and Paper Co., at Kapuskasing, where Morrow and Beatty, of Peterboro, have the contract for the erection of the four-machine mill of the Kimberly-Clark and New York Times interests. The contract for the electrical equipment both at the mill and at the hydro-electric power plant at Smokey Falls has been awarded to the Canadian Comstock Co., of Toronto.

Purchase of 130 feet of frontage on the north side of Pearl street, Toronto, as a site for a large building to be used as a new unit of their existing factory is announced by the Telfer Paper Box Co., now located on Duncan St. The lot secured is at the rear of the firm's buildings and is admirably adapted for the purpose of extension.

Progressive Corrugated Equipment Co., Ltd., which some time ago secured a charter, will shortly establish a plant in London, Ont., for the manufacture of paper boxes, and it is expected that about fifty hands will be employed at the start. L. H. Schroeder, of New York City, is the president of the company, which also proposes to start up a factory in Montreal.

Charles Allen, who for the past year and a half has been sales manager of the United Paper Mills, and before the acquisition of the Allen Paper Co., by the former organization was head of the latter firm, has retired owing to poor health, and will enjoy a long period of rest. Mr. Allen before launching the Allen Paper Co. was for many years on the sales staff of the Buntin Reid Co. C. W. Paull, who for the past eight years has been manager of the Hamilton branch of the organization, has been appointed to succeed Mr. Allen, and before leaving Hamilton was tendered a farewell banquet by the employing printers of that city.

New Board Mill for Toronto

It is understood that satisfactory arrangements have been effected for the location of the new 60-ton board mill of the Canadian Paperboard Co., on the Ashbridge's Bay property, Toronto, and that plans for the new structure ore well under way.

Building operations will start in the near future, and the plant, which will turn out all kinds of boards, will be in operation in a year's time. This will make the fourth unit of the Canadian Paperboard Co., the other plants being located at Montreal, Frankford and Campbellford.

United Paper Mills, Toronto, have been appointed Ontario distributors for the Esleeck Manufacturing Co., Turner's Falls, Mass., in the line of onion skin, manifold, typewriter and thin bond papers.

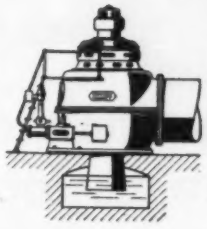
Frank G. West, who for over thirty years was in the employ of Ritchie and Ramsey, Ltd., coated paper manufacturers, Toronto, passed away recently in his fifty-seventh year. For a long period he was assistant superintendent of the plant and a few months ago was made superintendent.

Geo. W. Mead, president of the Thunder Bay Paper Co., of Port Arthur, and of the Consolidated Water Power and Paper Co., of Wisconsin Rapids, Wis., was in Port Arthur recently, examining the company's new newsprint mill, which was started up a few weeks ago. Mr Mead addressed the Port Arthur Rotary Club, after which all the members proceeded in a body to inspect the new mill.

New Grades Turned Out by Superior Paper Mills

The first machine of the Superior Paper Mills, of Thorold, which was started up in July, is a seventy-inch fourdrinier for making book, bond, featherweight waxing paper, antique

RODNEY HUNT



More Improvements have been made in

Turbine Water Wheels

in recent years than in Steam, Oil and Gas Engines combined

Your Water Power Equipment may be **Wasting** instead of **Earning**

The Fisk Paper Co. writes—

The 39" wheel you have just put in enables us to run our mill entirely with water and this in spite of the fact that we still run the 33" wheel which uses one-third more water than your new 39" wheel.

We were never able to get enough water through our flume to run the old 39" wheel without pulling the head way down; our new 39" wheel runs full gate without reducing the head by even one inch.

We estimate that new wheel is at least 50 per cent more efficient than old wheel and will pay for change in a few months.

Let a Rodney Hunt Engineer look at your plant without obligation

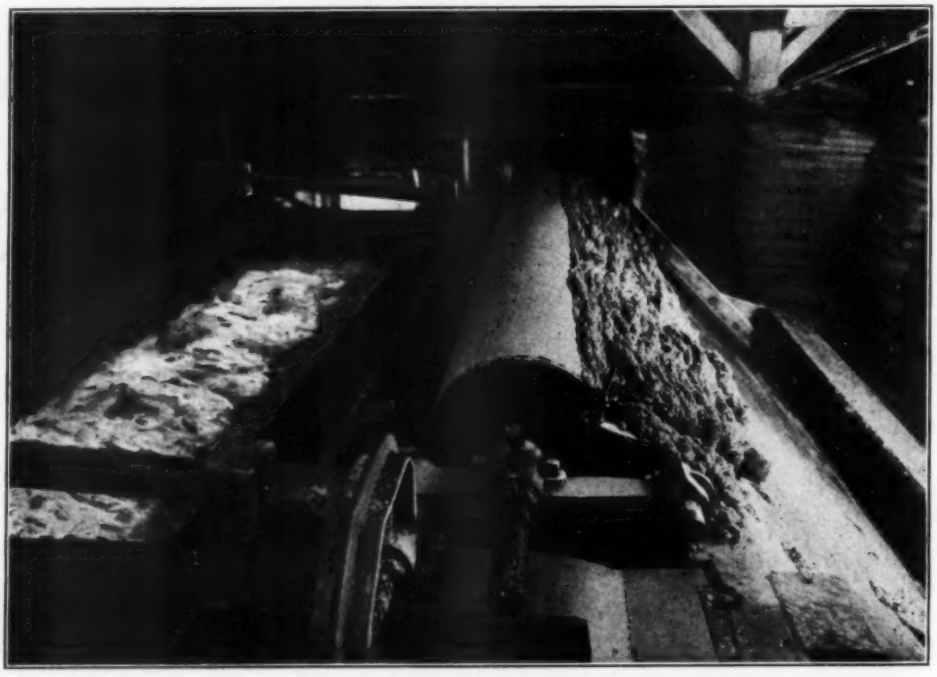
Rodney Hunt Machine Co.
38 River Street, Orange, Mass.

RODNEY HUNT

The Experience of 50 Years is of Value to You

OLIVERS

are not only efficient in operation but are also economical to maintain



Oliver Ground Wood Decker

From a Mill report on OLIVERS in a Maine Mill:—

"The cover on one of our OLIVERS ran a **little over two years** and was changed the 15th of last March. The other has run about seventeen months. We watched these carefully and, while the old cover had a few cracks which we soldered before it was removed, **we cannot find any hole in either of them now.**"

Changing a cover takes from three to five hours which, for a three hundred day year, figures out at less than thirty seconds per day.

See page 378 in the 1927 Paper and Pulp Mill Catalogue.

Oliver Continuous Filter Co.

San Francisco
802 Cunard Building
Oakland, Calif.
4th & Madison Sts.

New York
1547, 33 W. 42nd St.
Johannesburg, South Africa
E. L. Bateman, Locarno House

London
11 Southampton Row
Honolulu, T. H.
W. A. Ramsay, Ltd.

laid, and colored cover paper in seven different colors and two grades. In addition it will manufacture thin catalogue paper.

The second machine, which was started up last month, is a specialty cylinder machine for the manufacture of pattern and twisting tissue. Superior Paper Mills is the only mill in Canada making this particular grade. As regards its specialty machine, the company has already got orders in sight for a whole year, subject to the products it turns out being equal in standard to goods of the same kind at present being imported.

The combined capacity of the two machines is about 3500 tons per annum. The mill employs about fifty people.

The four new "moth" airplanes that lately arrived for the service of the Ontario Government forest patrol are being found most satisfactory in operation. They are being used as advance scouts for the heavier machines. The Province's air fleet now totals sixteen in number.

Contracts for the erection of seventy-four residences at Kapuskasing, to cost $281,000 have been awarded by the Spruce Falls Power and Paper Co. to Hill-Clark-Francis, Ltd., of New Liskeard. The houses will all be of frame and stucco construction.

Abitibi Jottings

P. H. Kennedy, who had been at Iroquois Falls since 1918, has left to take a position in the electrical department of the Anglo-Canadian Pulp and Paper Co., at Quebec.

D. W. Ambridge has also left Iroquois Falls to join the staff of the Anglo-Canadian Pulp and Paper Co.

Frank Stoughton, who had been tour boss since 1921, has moved from Iroquois Falls to Kapuskasing, where he will be superintendent of the new paper mill now in course of construction by the Spruce Falls Power and Paper Co., the Canadian subsidiary of the Kimberly-Clark Co., of Neenah, Wis.

The production record of the newsprint mill at Iroquois Falls was boosted to 573 tons on July 20, while during the same week the average daily production was brought up to over 555 tons.

George Garner, since 1919 efficiency and production engineer with the Canadian General Electric Co., at the Davenport works, Toronto, resigned recently to become general superintendent and production manager of pulp and paper machinery and general engineering work for the Port Arthur Shipbuilding Co., Port Arthur.

MANITOBA

Results of Timber Limit Survey

According to Hon. Charles Stewart, Minister of the Interior, Ottawa, the survey of the timber limits of the Manitoba Pulp and Paper Co., on the east side of Lake Winnipeg, is proving disappointing. The total is likely to be about 4,000,000 cords instead of 6,000,000 which was the minimum estimate.

Mr. Stewart recently visited Pine Falls, the site of the company's new mill, and said that the industry was progressing wonderfully. He was enthusiastic over the manner in which the town site had been built up.

He added that there had been no word yet of any one asking for the White Mud power site, although certain interests in the East at the present time are trying to arrange for backing.

BRITISH COLUMBIA

Beaver Cove Survey Under Way

Recent advices from the West say that preparatory to establishing one of the largest pulp and paper mills on the

SPEED Is Not All!

Speed is only one of several reasons why mills in ever increasing numbers are installing DAYTON HIGH SPEED BEATERS. Were speed the only consideration fewer mills would install them.

The acceptance of Dayton High Speed Equipment—either new or holland engines reconstructed—is based upon all six of the advantages claimed for it, and not upon "speed" alone.

Superintendents in mills where "Daytons" are in use will be glad to discuss Dayton High Speed equipment with you, from which you can form your own estimate of its probable worth to you.

Not One—But All Six

Heavier Furnishes
Faster Beating
Greater Output
More uniform product
Saving in power
Saving in labor

The Dayton Beater & Hoist Co.
Dayton, Ohio

Eastern Representatives: E. K. Mansfield & Co., 501 5th Avenue, New York, N. Y.

DAYTON
High Speed Beaters

COUNTER ROLLS

RIGHT OFF THE END OF YOUR PAPER MACHINE

For cleanly cut, accurately wound counter rolls, right off the end of your paper machine let us install a CAMACHINE 18. It will slit and wind counter rolls dependably and well. It will keep ahead of your paper machine, whatever its speed, when running 9 inch diameter rolls with frequent changes of slitting width. In a word-- for counter rolls-- a CAMACHINE.

Our liberal sales policy will permit your trying out a CAMACHINE for 30 days without obligating yourself to buy, so give us the opportunity of proving to you that CAMACHINES are all we claim them to be.

CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN, N.Y., U.S.A.

Pacific Coast at the north end of Vancouver Island, a party of surveyors headed by D. C. Henny, of Portland, Ore., a noted hydraulic authority, is making an investigation of the possibilities of this region.

The company represents the reorganization of the Beaver Cove Pulp and Timber Co., control of which was recently purchased by the International Harvester interests. An initial expenditure of about $10,000,000 will be made in the establishment of the first unit of what will be eventually a 500-ton mill. The surveys will take about a year to complete.

New Building at Woodfibre

The British Columbia Pulp and Paper Co. is asking for a tender for the construction of new buildings at the Woodfibre plant. The building will cost $20,000 and the equipment approximately $80,000, this new equipment being designed to improve the quality of the pulp. Extensive investigations are also under way for the utilization of different qualities of wood for the manufacture of rayon pulp.

NEW BRUNSWICK

Hope for New Mill

It is reported that William M. Sullivan, who has been operating a saw mill at Nelson, N. B., which is between Chatham and Newcastle on the Miramichi River, for some years is contemplating the erection of a plant for the manufacture of pulp and paper. Financial support for this project is said to have been assured with New York capital predominating.

Tentative plans are said to call for the construction of a mill that will be ready for operation by the close of 1928 at the latest. Nothing very definite has been announced in connection with the plans. If the mill becomes a reality, it will be the only paper plant operating on the Miramichi.

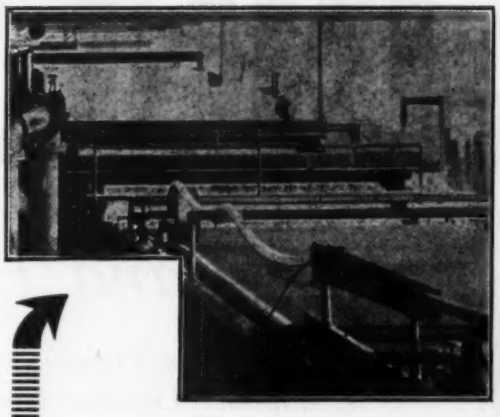
Construction is progressing on the Grand Falls hydro-electric development of the St. John River Power Co., a subsidiary of International Paper. Work has been begun on the forms for the concrete lining of the pressure tunnel, and also on the west end of the cofferdam for the main dam. Preliminary work has been started on the erection of steel penstocks.

Heavy operations in fire-damaged timber for pulpwood are being carried on along the Upsalquitch River, in territory which was extensively damaged by the big forest fires of 1923. This is the fourth season since the fire, and the timber is in excellent condition, according to the reports received by the Chief Scaler's branch. It is estimated that for three or four years longer the timber can be salvaged economically before decay advances sufficiently to make the wood useless. The fire-damaged timber has not been touched by worms, which bore into standing trees which have been killed with the bark still on them.

Fraser Companies Prospering and Expanding

It is understood that Fraser Companies' earnings for the six months ended June 30th 1927 have been satisfactory and that the company's net profits available for dividends on its common shares, after bond interest, preferred dividends and all charges, were approximately five times earned on the same basis as for the first six months of 1926. This is largely due to increasingly profitable operation of the company's sulphite paper mill at Madawaska, Me., which a year ago was just coming into operation and is now operating most satisfactorily at full capacity with substantial orders booked ahead. The company have decided to extend their paper mill, and ground has already been broken at Madawaska for a $2,000,000 extension.

The market for Spruce lumber has improved substantially, and the company's profits from this product should be still further increased to a considerable extent by their recent acquisition of the woodlands of the Richards Manufacturing



Superior materials

MADE of the best phosphor bronze or brass, the toughness and strength of Superior wires enable them to withstand the hardest usage for the greatest length of time.

Wires and facings for

Fourdriniers, Harpers and Yankees
Cylinder Machines and Wet Machines
Thickeners, Deckers and Save-alls

The William Cabble Excelsior Wire Mfg. Co.

74-88 Ainslee St.
143-151-163 Union Ave. Brooklyn, N. Y.

DIGESTERS

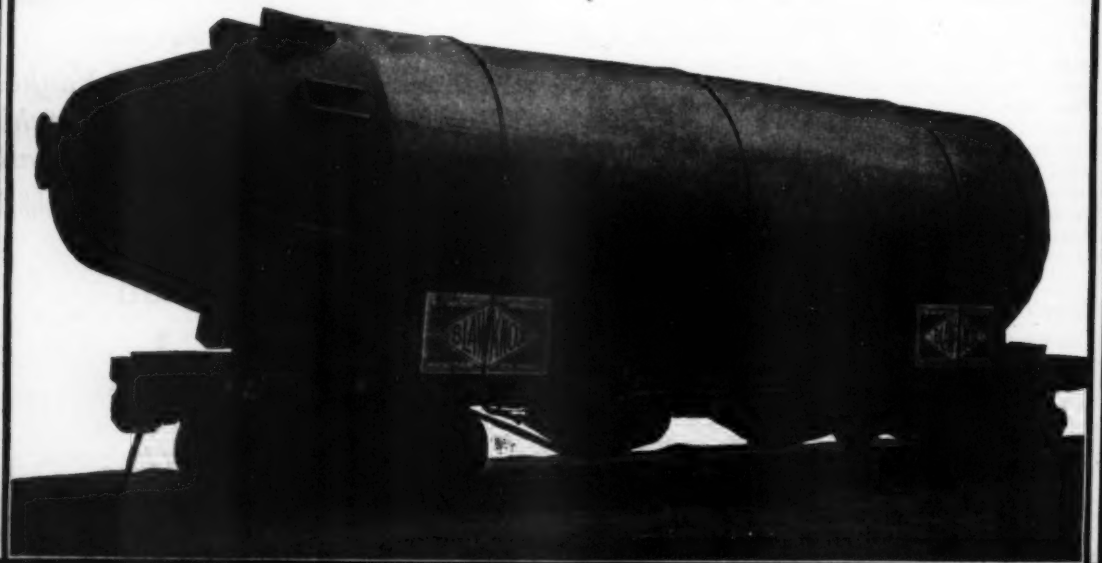
Forge and Hammer Welded

Blaw-Knox Forge and Hammer Welded Soda and Sulphate Digesters have a 100 per cent successful record. They are annealed in one piece, providing perfect homogeneity. All Blaw-Knox Digesters are designed to conform with the A. S. M. E. Code and insurance requirements. Prompt deliveries on both stationary and tumbling types. Write for your copy of the Blaw-Knox Forge and Hammer Welding Catalog.

BLAW-KNOX COMPANY

685 FARMERS BANK BLDG., PITTSBURGH, PA.

NEW YORK BALTIMORE BIRMINGHAM DETROIT
CHICAGO BUFFALO CLEVELAND PHILADELPHIA
SAN FRANCISCO



BLAW KNOX

Co. in Restigouche County, where the latter held 496 of Crown lands under lease.

WISCONSIN NEWS

Reforestation Conference

The paper industry, ranking fourth in Wisconsin, with respect to value of products, and first among the wood using industries, is most of all affected by the rapidly depleting forests of the state, and must therefore take the lead in the conservation of its forests and in a sane program of reforestation, it was pointed out at a reforestation conference held in Green Bay last month under the auspices of the Wisconsin Hemlock Manufacturers' Association.

One of the principal speakers at this meeting was D. C. Everest, general manager of the Marathon Paper Mills Co., Rothschild, and president of the American Pulp and Paper Association. Mr. Everest declared that the future of the pulp and paper industry in Wisconsin depends on the rapidity with which it enters upon an active campaign in utilizing what there is at hand in the way of lands and knowledge of forest crop growth. The way has been made easier through the passage of a forestry amendment to the state constitution and the enactment of favorable taxation laws by the last legislature.

The receivership sale of the Peshtigo Paper Co., which was scheduled for August 1st, has been postponed until sometime in September. The condition of the concern has been greatly improved since P. M. Allen, of Detroit, became receiver and manager.

Additional sidetracks of the Chicago and Northwestern Railway have been built for the benefit of the Combined Locks Paper Co., of Combined Locks, Wis.

Fire causing damage to the extent of about $25,000 broke out last month in one of the plants of the Peshtigo Paper Co. The amount was fully covered by insurance.

Frank J. Schneller, vice president and sales manager of the Gilbert Paper Co., Menasha, has been signally honored by his election to the office of Wisconsin Department Commander of the American Legion. He will lead the Pilgrimage of Wisconsin Legionnaires—about 425 in number—to the tenth anniversary national convention of the Legion in Paris this month.

After a brief shutdown to allow for the installation of four modern beaters, replacing seven obsolete ones, the Menasha Paper Mills Co., of Menasha, is again in operation manufacturing strawboard.

Improvements have been made in the boiler house and power plant of the Riverside Fibre and Paper Co., Appleton.

Paper mills of the Fox River Valley had a group of exhibits at the Wisconsin State Fair which opened recently at Milwaukee. The exhibits were held in the Manufacturers' Building.

The DePere Paper Manufacturing Co., DePere, has begun the construction of a second paper machine. The company has been in operation for a little more than a year. Capacity of the new machine will be twenty-five tons of paper a day.

Northern States Power Company is erecting a new hydro-electric plant at Chippewa Falls.

The city of Kaukauna is about to build a new municipal electric power plant. The city furnishes power to various paper mills in Kaukauna.

The first of the homes to be built in the Lake development project of the Northern Paper Mills at Chalk Hills and White Rapids on the Menominee River are under construction. These are for men to be employed in the hydro-electric plants there.

This Is All You Need to Open or Close a Darling Valve

COMPARISONS favor Darlings. Take it from any slant you like—ease of operation, long life, accessibility, quick repair or ultimate cost.

Men of wide experience in paper industries—men who have made a thorough study of valve performance under the most trying conditions—find Darlings most economical and most reliable in service.

Write for details of design and construction.

DARLING VALVE & MFG. CO.

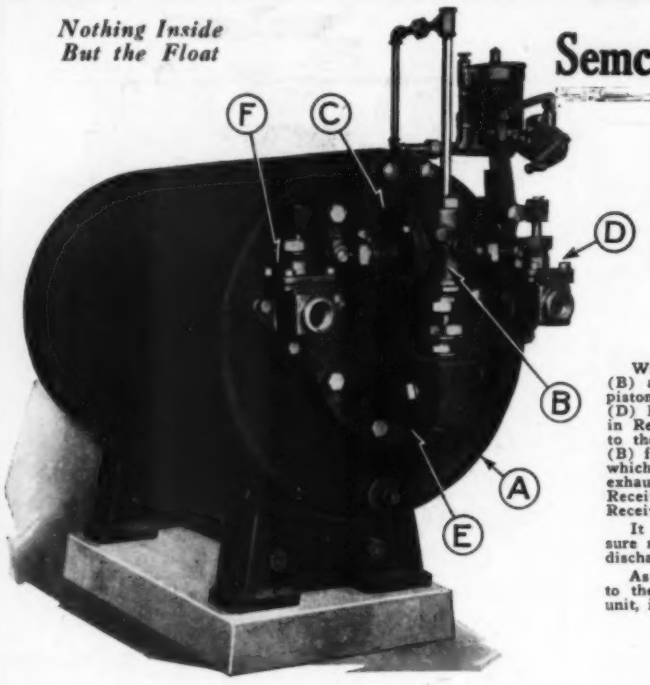
Williamsport, Pa.

New York
Chicago

Oklahoma City
Houston

DARLING
GATE VALVES

Nothing Inside But the Float



The Semco Automatic Receiver Pump

Operates on either steam or compressed air. We can furnish pump and receiver complete, or equip your present receiver.

Semco Automatic Receiver Pump

Designed to efficiently handle high or low temperature fluids such as condensate, oil, acids, etc. Especially applicable for use in draining and pumping condensate from paper machines, and feeding boilers.

The "Semco" has the least number of parts and is the most efficient pump on the market for handling high temperature fluids.

OPERATION:

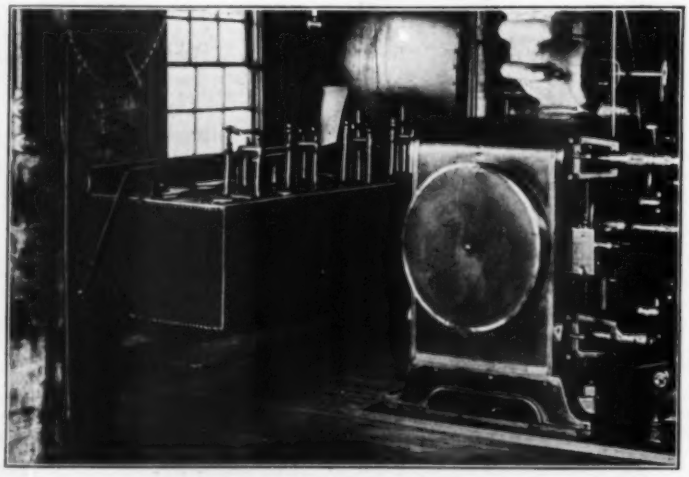
When Receiver (A) fills float actuates Cylinder control Valve (B) allowing pressure to flow to operating cylinder (C) forcing piston to its extreme travel, opening High pressure Steam Valve (D) High pressure steam flowing to Receiver (A) through ports in Receiver Head (E). When fluid in Receiver (A) has lowered to the sealing level float again actuates Cylinder control Valve (B) forcing piston in Cylinder (C) to its extreme opposite travel, which action closes High pressure steam Valve (D) and opens exhaust or equalizing Valve (F) discharging the pressure in Receiver (A) through port in Receiver Head (E) which allows Receiver (A) to refill.

It is to be noted that the live steam builds up only to the pressure required to force condensate out of Receiver, as condensate discharges as fast as steams flows in.

As the live steam used to discharge condensate, is vented back to the unit being drained, heating system or any low pressure unit, it is obvious that the live steam consumption is very small.

Stebbins Engineering & Mfg. Co.

WATERTOWN, N. Y.



The battery of Bowser storage tanks (at the left) shows how one plant stores a large supply of lubricants and makes them convenient —at the same time they're kept absolutely free from dust and dirt.

Making the lubricant *convenient* is the first step in making lubrication efficient!

Making it convenient — that's our specialty. We thereby save men's time, make machinery last longer and avert fire risks—yes, and show you how to economize on the lubricant, too!

For our suggestions, address Dept. 3

S.F. BOWSER & COMPANY, Inc.

LUBRICATION ENGINEERS AND MANUFACTURERS

FORT WAYNE, INDIANA, U.S.A.

52 FRASER AVENUE, TORONTO, CANADA

The Menasha Printing and Carton Co., Menasha, which recently consolidated with the Marathon Paper Mills Company, of Rothschild, is preparing to move its sales offices to Chicago.

Whiting Plover Paper Co., Plover, Wis., is erecting a large addition to its rag storage warehouses. The building will be fifty by one hundred thirty feet, and three stories high.

A portrait of the late William M. Gilbert, founder of the Gilbert Paper Company, Menasha, has been presented by his widow to the Manufacturers National Bank, of Neenah, of which he was president. Mr. Gilbert died about a year and a half ago.

Henry Burges, formerly in the sales department of the Neenah Paper Co., Neenah, has resigned to take a similar position with the Parsons Paper Co., Millers Falls, Mass.

A new carton company, under the name of the Wisconsin Carton Company, has been organized at Neenah. It is capitalized at $100,000. Incorporation papers were signed by Alfred J. Danke, Neenah, Adam Schwartzbauer, Menasha, and James T. Mader, Appleton. It has been rumored that the new company will take over the Elm Paper Box Co., of Neenah.

The Menasha Printing and Carton Co., of Menasha, last month was host to about thirty of its traveling salesmen during a three-day conference. Trade discussion and entertainment were on the program.

The Wisconsin Power and Light Co., has been granted permission to build a dam and hydro-electric plant on the Menominee Indian Reservation in Shawano County, Wis. It will be located on the Wolf River.

A new finance company has been organized in Neenah under the name of Neenah-Menasha Finance Co., of which F. J. Schneller, vice president of the Gilbert Paper Co., Menasha, and W. A. Brooks, secretary of the Menasha Printing and Carton Co., Menasha, are directors.

NEW YORK CITY NEWS

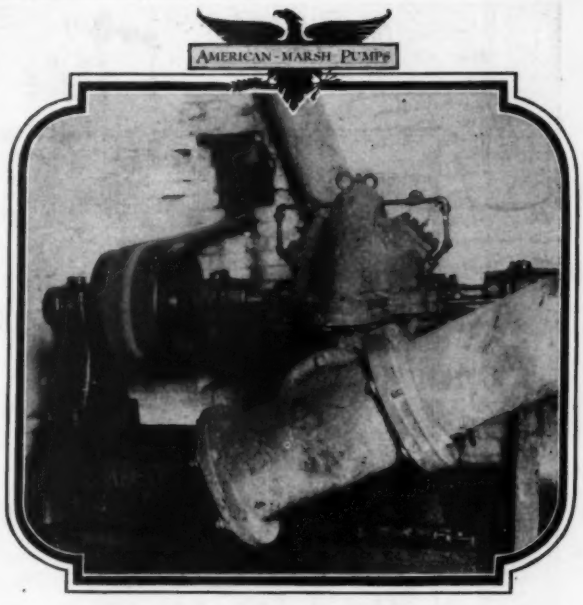
Big Gain in I. P. Earnings

The consolidated account of the International Paper Co. for the first half of 1927 shows total revenue of $7,071,551, net revenue available for dividends of $2,407,253, and a balance of $176,119 after dividends added to surplus. This compares with a gross of $4,431,662, a net of $1,277,216, and a surplus deficit of $71,893 in the same period of 1926. The gross revenue for the June quarter was $3,896,971, against $2,643,857 in the second quarter of last year, and net income after interest, depreciation, amortization and Federal taxes of $1,413,029, compared with $1,015,507 in the year before. The surplus on June 30, 1927, was $22,463,949, contrasted with $21,854,114 at the end of June a year ago.

The dividend charges shown for the second quarter of 1927, amounting to $1,397,453, represent the accrual during that quarter of the dividends payable in the third quarter. As a large amount of additional preferred and common stock was issued late in the second quarter, the dividends payable in the third quarter and accrued during the second quarter exceeded the dividends actually paid during the second quarter by $563,773. Dividend charges were $799,593 in the second quarter of 1926.

Certain-teed Earnings Increase

The net income of the Certain-teed Products corp., manufacturer of roofing paper and other products, for the first half of 1927 available for dividends amounted to $1,125,573, equal after first and second cumulative preferred dividends to $2.89 a share earned on 307,000 outstanding shares of no par common stock, compared with $1,120,420, or $2.84 a



A Notable Record on a Hard Job

THE American-Marsh Centrifugal Pump shown above is installed at Rex Paper Company, Kalamazoo, Michigan. It has just completed its third year of continuous, 24-hour-day service—without a single repair—without attention, except lubrication. Yet this unit handles 500 gallons per minute of white water heavy with English clay and alum—a notable record on a hard job.

In all there are over a dozen American-Marsh Pumps operating today in the Rex Mill, and N. E. Schell, chief engineer, states that every pump has proved trustworthy, performing exactly as we specified that it would.

Let Us Figure With You

Don't take a chance. Paper making to be profitable must be continuous and pump failure can mean a heavy loss. If you need dependable pumps for any mill service, consult with our engineers. We build a complete line—high-grade centrifugal and steam pumps of all approved types—pumping units which assure your mill the same unfailing service that Rex Paper Company now enjoys. Write for our Bulletins, giving us a summary of your particular problem.

AMERICAN-MARSH

AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN
Sales Engineers in All of the Principal Cities

Centrifugal Pumps

So One Thought May Survive

IN a lifetime of painstaking, eye-tiring effort, the medieval monk made a few copies of some precious book whose ideas must be passed on to posterity. Hundreds of things that might now seem to be worth knowing were discarded into an unrecoverable oblivion because the book maker had to limit his copying to the few things he chose as most important.

Today our literature is multiplied, not a letter at a time, but by the carload. Most that is printed is of fleeting value—much indeed, valueless. But among the tons of printing there are passed on, to all who wish to know, the worth-while ideas of the human race, those ideas that may seem of passing moment today only to be judged important by the next generation.

The censorship imposed by lack of paper long held back literature, restricted its quantity, limited its universality. Generous amounts of paper have made possible the presses that imprison the ephemeral thought that some future generation may release for the broad benefit of mankind.

Hammermill Paper Company

Erie, Pennsylvania

share, earned in the first half of 1926. After all dividends, $191,500 was appropriated for the redemption of first preferred stock, against $199,877 in the same period of 1926. In the half year $180,000 par value of first preferred stock was purchased and retired.

Current assets, not including inventories, were $3,766,237 on June 30 last, against current liabilities of $2,787,798. Inventories amounted to $5,136,860. The earned surplus was $1,797,227, compared with $1,714,979 at the end of 1926.

In his report President George M. Brown says, in part: "During the past few months we have been considering various plans for enlarging our business by the acquisition of other important properties. These considerations have been discontinued. As a part of the plans for enlargement of the business an option was given to bankers to purchase 93,000 shares of our common stock. Finding that our later plans did not require the sale of any additional stock, this option was canceled at our request. At present there is no plan for increasing the number of shares outstanding."

New Paper Mill

The new mill to be erected by the Spencer-Wayne Paper Products Co., Inc., recently organized with a capital of $750,000, will be located on a site selected at Dickson, Renwick and Robinson avenues, Newburgh, N. Y. It will be a one-story brick building, and will cost about $100,000, with equipment, according to reports.

The general contract for the construction of the building has been let to the H. K. Ferguson Co., of Cleveland, O. Roy W. Spencer, of Newburgh, will be president of the new organization, which is represented by John B. Corwin, Savings Bank Bldg., Newburgh, attorney. Prentis D. Wynne, of 213 Ashby Road, Upper Darby, Pa., will also be an official of the company.

The Povy Paper Co., Inc., jobbers of paper and twine of 213 Washington St., New York, made an assignment on August 13 to Nathan Frankel, of 20 West Sixty-ninth street, New York.

New Manufacturers' Supply Concern

Cantasano-Williams, Inc., is the name of a new concern organized and incorporated under New York State laws to deal in paper manufacturers' supplies of all kinds by Charles Cantasano and Ralph O. Williams. The company has established offices in the Tribune Building, 154 Nassau street, New York. Mr. Cantasano has been associated with Cantasano Brothers, of New York, packers of paper stock and has spent 25 years in the paper stock trade. He will continue his warehouse operations in addition to his new activities. Mr. Williams formerly was with the Robert Gair Co., and more recently has engaged in the paper stock business under his own name.

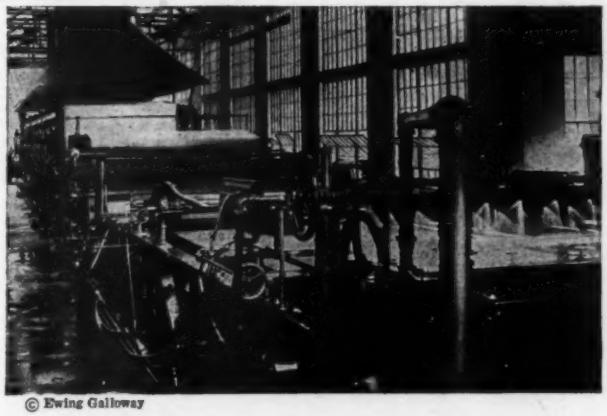
The J. A. Brookman Co., Inc., dealers in papermaking rags of 87 Greene St., New York, filed a petition in bankruptcy a few days ago, and later Irwin Kurtz was appointed receiver under bond of $1,000. Liabilities of the concern are estimated at about $10,000.

E. J. Keller, of the E. J. Keller Co., Inc., importers of and dealers in wood pulp and other papermakers' supplies of 200 Fifth avenue, New York, sailed on August 19 for a two months' business trip to Europe.

Morris Solomon, dealer in paper and twine, of 2705 Holland Ave., New York, has filed a petition in bankruptcy placing liabilities at $52,825 and assets at $2,000.

The Canadian Newsprint Paper Co., Ltd., of Montreal, Can., has leased quarters in the new Graybar Bldg., at 420 Lexington Ave., for New York offices.

J. R. Haney has opened offices at 17 East 42nd St., New York, and will represent the following concerns in the sale of waxed paper products: The Cleveland Waxed Paper Co.,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Get this *double* cleaning economy

IMPORTANT time and labor savings are not the only benefits of using Oakite for paper mill cleaning.

Still another economy—a remarkable saving in material—results from cleaning the Oakite way. Because of its more vigorous action, a smaller quantity of Oakite is required for washing felts, cleaning Fourdrinier wires, cylinder rolls, screens, sieve cloths and other equipment. Oakite will do three or more times the work of soaps, soda, soda ash and similar cleaners.

An Oakite Service Man is at your disposal to enable you to obtain this *double* Oakite economy and the better, more thorough cleaning that goes with it. Write for particulars, without obligation.

Oakite Is Manufactured Only By

OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK, N.Y.
(Formerly OAKLEY CHEMICAL CO.)

Oakite Service Men, cleaning specialists, are located at

Albany, N. Y., Allentown, Pa., Altoona, Pa., *Atlanta, Baltimore, *Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, Buffalo, *Camden, N. J., Charlotte, N. C., Chattanooga, Tenn., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, O., Decatur, Ill., *Denver, *Des Moines, *Detroit, Erie, Pa., Flint, Mich., Fresno, Cal., *Grand Rapids, Mich., Harrisburg, Pa., Hartford, Houston, Texas, *Indianapolis, *Jacksonville, Fla., *Kansas City, *Los Angeles, Louisville, Ky., *Memphis, Tenn., *Milwaukee, *Minneapolis, *Moline, Ill., *Montreal, Newark, N. J., Newburgh, N. Y., New Haven, *New York, *Oakland, Cal., Omaha, Neb., *Philadelphia, *Pittsburgh, Portland, Me., *Portland, Ore., Providence, Reading, Pa., *Rochester, N. Y., Rockford, Ill., *Rock Island, *San Francisco, *Seattle, St. Louis, South Bend, Ind. Syracuse, N. Y., *Toledo, *Toronto, Trenton, N. J., *Tulsa, Okla., Utica, N. Y., *Vancouver, B.C., Williamsport, Pa., Worcester, Mass.

*Stocks of Oakite materials are carried in these cities.

OAKITE
TRADE MARK REG. U.S. PAT. OFF.
Industrial Cleaning Materials and Methods

FARREL

178" Stack with Hydraulic Lift

FARREL CALENDERS
AND
FARREL ROLLS

are made in all sizes
up to and including

264" ON THE FACE

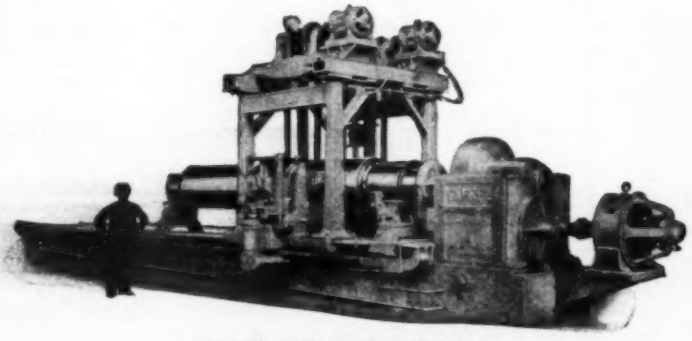
Calenders are made with HYDRAULIC, ELECTRIC OR RATCHET LIFT, all operated from the floor.

MACHINERY BUILDERS SINCE 1848

Seventy-Nine Years Experience

FARREL NEW TYPE ROLL GRINDER

is built in 24", 32", 36" and 42" sizes, all electrically driven throughout, lubricated automatically and fitted with geared head, new crowning device and other improvements.



36" New Type Roll Grinder

FARREL FOUNDRY and MACHINE CO.

Established 1848

ANSONIA, CONN.

Branch Plant: BUFFALO, N. Y.

Central Waxed Paper Co., Ohio Wax Paper Co., Otsego Waxed Paper Co., Shawmut Waxed Paper Co., and Waterproof Paper and Board Co.

NORTHERN NEW YORK NEWS

Stuart D. Lansing Dead

Stuart D. Lansing, president of the Bagley & Sewall Company, manufacturer of paper making machinery, died at his home in Watertown on the morning of Sept. 3, following a two weeks' illness with heart trouble.

Mr. Lansing was a native of Watertown and his great grandfather, Noahdiah Hubbard, was the first white settler in Jefferson county. His grandmother was the first white child born in the county.

Mr. Lansing graduated from the University of Pennsylvania in 1888 and the same year he accepted a position in the Bagley & Sewall company as timekeeper. In 1894 he married Carrie Sherman Bagley, daughter of the late George A. Bagley, president of the company. He learned the business thoroughly and mastered all of the details. He became an expert in plant production and in 1897 he was elected secretary of the company. In 1913 he was elected vice-president and director. On the death of Mr. Bagley, Mr. Lansing was elected president of the company in 1915.

In addition to the presidency of the Bagley & Sewall Company, he served several years as president of the Jefferson County National Bank, and at the time of his death he was chairman of the board. He was president of the Jefferson County Historical Society and was an expert archaeologist. He was much interested in yacht racing, had served as commodore of the Crescent Yacht Club and as president of the Lake Yacht Racing Association.

He is survived by his widow, two sons, Edward S. Lansing, assistant to the president of the Bagley & Sewall Company, and A. TenEyck Lansing, and one daughter, Mrs. Edwin G. Fullinwider of Honolulu.

The late Mr. Lansing was a cousin of Robert Lansing, former Secretary of State under President Wilson in the early days.

Diana Installs New Equipment

About $300,000 is being expended by the new owners of the Diana paper plant at Harrisville. The company now owning the mill is the Harrisville Paper Corp. It is a subsidiary of the St. Regis Paper Company, and will reopen about Oct. 1.

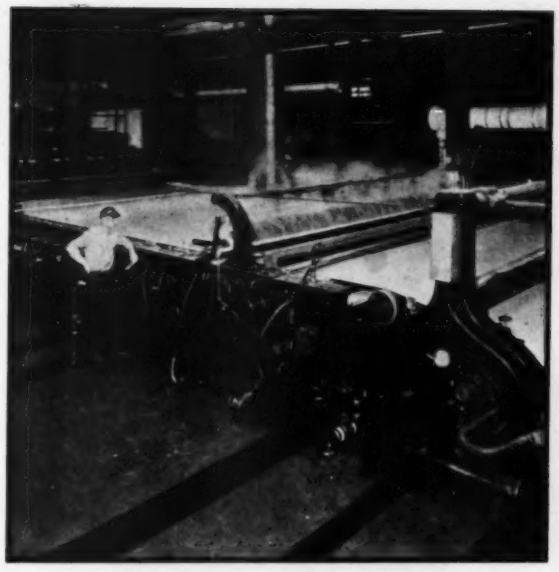
The expenditure covers the installation of electric grinders in the pulp department, new slusher tanks and other machinery. The new concern will not manufacture glassine as originally planned but will go into hangings and other grades which can be made with a minimum of chemical pulp.

Peter Badore, 42, and Frank Dumas, 55, employees of the International Paper Company plant at Piercefield, were instantly killed on the morning of Aug. 15 by a steam explosion at the plant. A steam vat of a drying machine blew up while the men were adjusting it.

Paper Companies Assessed

Paper manufacturing concerns will pay the bulk of assessments toward the cost of the construction of the Conklingville reservoir on the Hudson river.

Assessments against corporations in Glens Falls and vicinity follow: Finch, Pruyn & Company, $10,575.63; Moreao Manufacturing Co., $403.65; International Paper Co., at Queensbury, $28,174.77; International Paper Co., at Luzerne, $639.11; Adirondack Power and Light Corp., $841.40; International Paper Co., at Luzerne, $4,127.32; Warren Curtis Manufacturing Co., $259.01; at Moreau, International Paper Co., $8,964.39; Union Bag and Paper Corp., $13,058.87; International Paper Co., $10,575.63; Moreau Manufacturing Co., $7,659.26; International Paper Co., $3,202.29; Adirondack Light and Power Corp., $33,812.42; at Corinth, International Paper Co., $37,139.19; Warren Curtis Manufacturing Co.,



NINETEEN TIMES as much water!

THE amount of water draining through a Fourdrinier Wire is about nineteen times the volume of the stock which forms the sheet.

To assure a perfect sheet of paper, free from thin spots or irregularities, this flood of water must be drained off uniformly over the width of the Fourdrinier Wire—the mesh must be uniform, and the wire surface must be smooth and level with no tendency to sag or wrinkle.

If you will try a Tyler Fourdrinier Wire on one of your machines and note the accuracy of mesh, the level, smooth surface, and the uniform deposition and drainage of pulp, you will understand why so many superintendents specify Tyler Fourdrinier Wires.

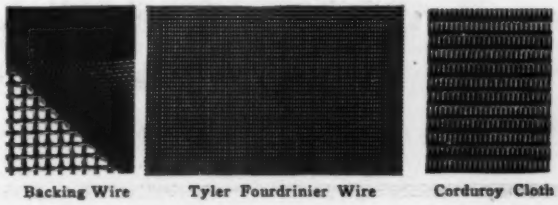
To assure an unvarying uniformity of mesh, and a weave that will remain smooth and level, Tyler Fourdrinier Wires are woven with extreme precision on looms especially designed and built in the Tyler plant, and operated by weavers who have made this art their life's work.

Let Tyler wires help you make better paper.

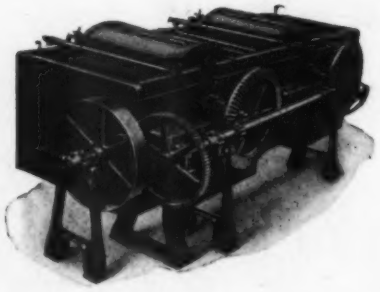
Supplied in all widths up to and including 250 inches

The W. S. Tyler Company

Cleveland, Ohio



Backing Wire Tyler Fourdrinier Wire Corduroy Cloth



Bleached Sulphite Washer

TWO A. D. WOOD CYLINDER TYPE

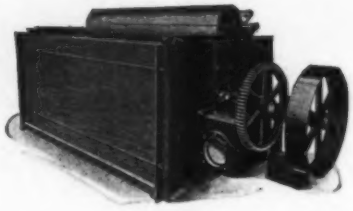
A high efficiency machine handling large capacity with low power and minimum upkeep.

Absence of couch or doctor and continuous self cleaning wire are important features in handling stock containing bleach liquor.

Simply and strongly constructed.

Our new collars ABSOLUTELY ELIMINATE losses by sealing straps. Furnished at nominal cost.

SEND YOUR ORDER AND GET THE BEST

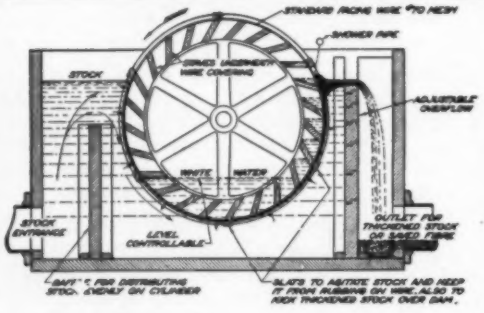


Decker and Decker Washer

We make many styles which are designed for various mill conditions and from an operating standpoint.

Our name on these machines gives you the assurance of many years of satisfactory performance.

The Walker Attachment is applicable to any model or to your present decker. It will increase their capacity 33% at negligible cost.



A. D. Wood Save-all

The A. D. Wood Machine as a Save-all is unique.

New sealing collars and ease of patching the wire mean maximum efficiency.

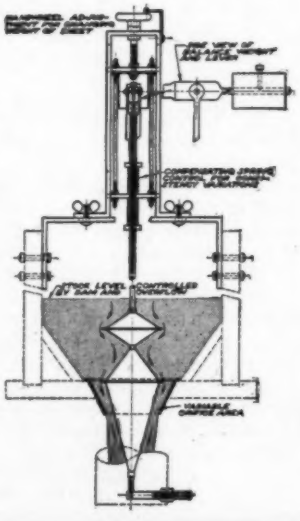
Simplicity, self-cleaning wire and continuous high capacity give satisfaction and greater savings.

We have reports of 90-95% efficiency for a four year period

Boivin Weight Regulator

FOR FOURDRINIER MACHINES

More than 50 already giving invaluable service on fast and slow speed machines, handling all kinds of stock. Install it, adjust to give desired weight, and leave it alone. Overweight claims eliminated, with big improvement in broke loss and running conditions. Handles capacities ranging from 15 to 150 tons with equal efficiency. Sensitive action and direct control.



Write Us Now for Details

PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

See pages 342 to 343 in the 1927 Paper and Pulp Mill Catalogue

$12,782.25, and at Hadley, Union Bag and Paper Corp., $10,814.46.

Tait Elects Officers

The following officers and directors were elected at the annual meeting of the Tait Paper and Color Industries, Inc., of Glens Falls: President, George Tait, Glens Falls; vice-presidents, T. S. Marshall, Karl McBride, S. Carter Hall and Philip Riley; secretary, Erskine C. Rogers; treasurer, John H. Coy.

Directors elected are George Tait, M. L. C. Wilmarth, John H. Coy, S. Carter Hall, T. S. Marshall, Karl S. McBride, all of Glens Falls; Erskine C. Rogers and Philip Riley, Hudson Falls; A. C. Hart, Hackensack, N. J.; Albert W. Emerson, Warrensburg; William Seber, James K. Welch and William Rowe, New York.

The Coty Machine Co., of Watertown, has just installed a rotary bottomer and automatic feeder unit in the plant of the Adams Bag Company at Chagrin Falls, Ohio. The tests made show that the machine can bottom sacks at the rate of 136 a minute, with lowered waste and labor costs.

Carlisle Heads Oswego Board Company

Floyd L. Carlisle has been elected president of the Oswego Board Corp., recently formed at Oswego. The other officers are: Vice-presidents, H. E. Machold, Charles E. Norris and R. B. Maltby, of New York, and E. E. Whitney, of Oswego; secretary, R. F. Ferguson; treasurer, F. A. Rogers; assistant secretary, F. Hayes LaFaivre.

The board of directors consists of Floyd L. Carlisle, R. B. Maltby, H. E. Machold, Charles E. Norris, E. E. Whitney, R. K. Ferguson, D. M. Sutherland. Headquarters of the company will be located in Oswego. Work is being rushed to get the factory building enclosed before winter and it is planned to begin the manufacture of insulating board in May.

Contest in Union

W. R. Smith, of Albany, and Matthew J. Burns are candidates for the position of president of the International Brotherhood of Paper Makers. Mr. Smith is the present president and Mr. Burns is secretary of the organization. The election will be held between Oct. 1 and Oct. 15. The salary is $5,000 a year.

There is no contest for first vice-president, Frank P. Barry being unopposed. Nominations for the office of second vice-president include George J. Schneider of Appleton Falls, Wis., Simeon Weir of International Falls, Minn., Thomas McGrath of Escanaba, Mich., A. F. McLeod of Espanola, Ont., M. H. Parker of Skaneateles, Jeremiah T. Carey of Pontiac, Mich. David Lauerman of Tonawanda, and Arthur Huggins have no opposition for the offices of auditor and secretary, respectively. John Coughlin of Brooklyn, will oppose Archie Hook of Chicago, for treasurer.

Two New Patents

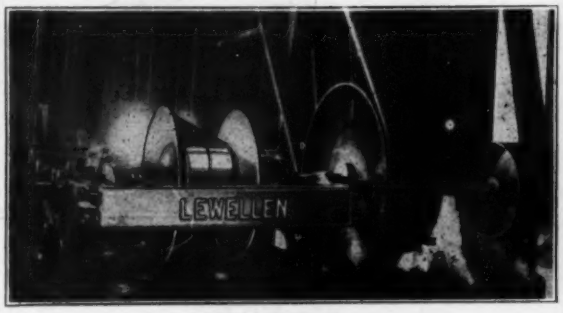
A new apron board for paper-making machines has been patented by C. W. Valentine, of Watertown, and the patent has been assigned to the Bagley & Sewall Co., of which Mr. Valentine is an officer.

A machine for making bottle caps has been patented by Anthony C. Artz, of Lowville, who has assigned the patent to the Beaverland Corp., of Lowville.

The Champion Paper Co., of Carthage, a member of the St. Regis group, has begun the manufacture of kraft paper to supply the Taggart Brothers Co., bag manufacturers, of Watertown. The Taggart Brothers Co. has a plant at Herrings for the manufacture of kraft paper for the bag mill in Watertown, but the supply was not equal to the demand, and it became necessary to go to outside sources. The Champion mill will make between 45 and 50 tons of kraft daily.

Pulpwood shipments through the St. Lawrence river canals showed a big increase for July. A total of 186,184 tons or

How About Your Cutter Drive?



No. 14, class "D" LEWELLEN Transmission driving Black-Clawson cutter at the Michigan Carton Company. Machine speed—50 to 250 F.P.M. Sheet length—16½" to 82½" at any speed.

This User Says:

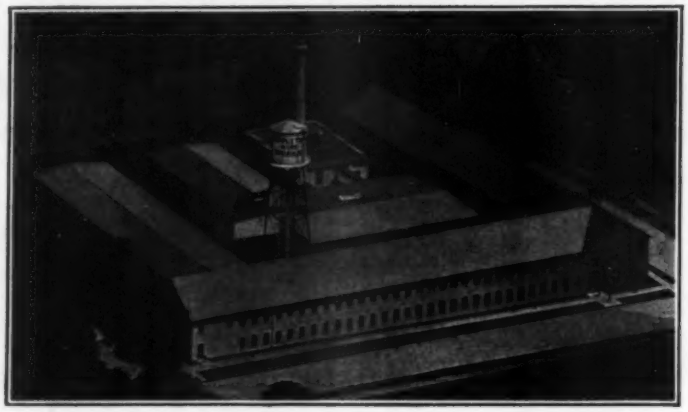
"As you know, the real reason for installing the LEWELLEN Transmission was to overcome the trouble we were experiencing with the variation in length of sheets on our cutter. We are very pleased to advise you that the LEWELLEN Transmission has given very satisfactory results and we have not been able to find a sheet that varies in length a full one-eighth of an inch. Due to the sturdy construction of your drive it operates without variation and from a mechanical standpoint this shows correct designing for a long-life machine. Taking these things into consideration was the reason we mailed you an order for a second LEWELLEN drive on our other machine."

The LEWELLEN Transmission enables you to cut sheets of uniform length at all times. We furnish blue prints showing complete installation at your mill, including pulley sizes, location of transmission, etc.

LEWELLEN MFG. CO.

Columbus, Indiana

LEWELLEN Variable Speed TRANSMISSION



APPLETON WIRES

Fourdrinier Wires
Cylinder Wires
Save-All Wires
Washer Wires

Dandy Rolls and Cylinder Moulds repaired and recovered.

Over fifty years of experience in manufacturing wires for American Paper Makers, and the ever increasing use of APPLETON WIRES testify to their quality.

Appleton Wires
are good wires
APPLETON WIRE WORKS INC., APPLETON, WIS.

93,092 cords was reported. The previous high record was in August last year when 74,037 cords were carried. A large percentage of these cargoes went to American mills.

A new 125-ton railroad track scale has just been completed at Deferiet which will be used to weigh paper in carload lots at the St. Regis plant.

Fighting Spruce Budworm

Aroused by the tremendous damage done by the spruce budworm to the spruce and balsam forests of Maine and the Eastern provinces, the New York State Conservation Commission and the Empire State Forest Products Association are undertaking an extensive survey of the Adirondacks and the Catskills to determine whether the budworm is present in those regions.

In the principal areas of balsam and spruce studied in the Adirondacks, the damage done was negligible, but the prevalence of mature balsam is provocative of serious attacks and points to the desirability of an early harvest of overmature spruce and balsam. The most serious damage noted thus far is on the Cedar river in Hamilton county where careful measurements show that over half the spruce and balsam is dead or dying.

The spruce budworm is a defoliating insect that feeds first on balsam and as this food becomes scarce spreads to spruce. If located in time the outbreaks can be stamped out by cutting the infected timber. Once an outbreak gets started it may spread at the rate of six or eight miles a year.

Johnson Goes to Sherman Company

Frank Johnson, who for some time was connected with the management of the Diana Paper Company's mill at Harrisville, has just been made superintendent of the Sherman Paper Company at Felts Mills. He will succeed John McLean.

Mr. Johnson, inventor of the glassine process of the Diana Co., was up to this time employed by the West End Paper Co., of Carthage. Mr. McLean will go to the West End mill to fill the place vacated by Mr. Johnson.

J. V. Baron, vice-president and general manager of the Sherman mill, said the reason for the change was that the Sherman mill was to decrease the manufacture of newsprint and go in for specialties.

The Sherman Paper Co. has been making a high grade of newsprint with a minimum of sulphite and has a long term contract with the Pittsburgh Press. One by one during the last ten years the newsprint mills have been going into the manufacture of other grades of paper. About the only mills in Northern New York which are producing newsprint are the St. Regis, the West End and the Gould Paper Co.

Work on Hudson Dam

Work will be started within a year on the construction of the proposed power dam and power plant being considered by the officials of the Union Bag and Paper Corp., on its property at Hudson Falls.

With a capacity of approximately 60,000 horse power, the proposed plant will have a hydro-electrical development equal to that of the Sherman island plant. It will cost between $2,000,000 and $3,000,000 and will take two years to construct. The dam will be from 20 to 25 feet high and will create a pond several miles in length.

The Dorr Co., engineers of New York City have just established a service department in charge of H. A. Linch, for the purpose of giving its customers specialized assistance in connection with the installation and initial operation of its equipment.

The Field-Hamilton-Smith Paper Co., of Omaha, Nebraska, has been made agent in that territory for the L. L. Brown Paper Co., of Adams, Mass. They will carry three of their main lines, Brown linen ledger, Greylock linen ledger and advance bond.

RYERSON

Immediate Shipment from Stock

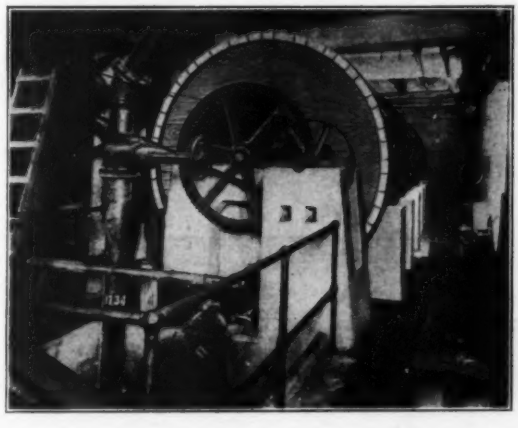
Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

STEEL



Paper Mill Tanks

The above installation in a well-known Ohio paper mill is only one of Hauser-Stander's successful installations.

Hauser-Stander has been building tanks for over fifty years and has particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.

CINCINNATI, OHIO

REED SPAFFORD

Pulp Screen

WHAT DOES YOUR **POWER** COST YOU

UNHEARD OF LOW **POWER** PER TON

HALF **POWER** SAVED

VERY LARGE CAPACITY

VERY LIMITED FLOOR SPACE

OFFERED ONLY AFTER MANY MONTHS OF CAREFUL DEVELOPMENT

Improved Paper Machinery Company

Nashua, N. H., U. S. A.

PACIFIC COAST NEWS

Pacific Coast Trade Conditions

Recent surveys of business conditions on the Pacific Coast indicate that conditions are fairly satisfactory at present, with high hopes of stimulation during the next few months. Vancouver, B. C., is having a prosperous year. Money is freer than usual, all basic industries are active, building expansion continues, collections are improving and there has been no recent labor trouble. New highways and an aggressive advertising campaign have combined to make the tourist season livelier than ever before.

In Seattle, retail merchants experienced a stimulation of business during August when the Pacific fleet was there for a week. Several conventions also helped. Building construction continues active and the lumber trade is in fair shape.

In Portland and throughout Oregon, business is fairly well stabilized, despite a general slowing up in some activities during July and August. Demand is good in the lumber industry with little fluctuation in prices. Rumors of a merger that would affect lumber interests have slowed up buying on a large scale but most lumber camps continue active. Crop and dairy outlooks are good. California conditions are fairly satisfactory. In San Francisco, Oakland and other northern and central California cities trading was quiet during July and slightly better in August. A good Fall business was expected, however, with ample capital available at easy credit rates. In general, lower profits in business were predicted for the last half of the year. The tourist business was very good. Los Angeles reported industries active for the most part, with profits considerably better for the first half of the year than the figures of a year ago. Where there is a decrease it seems to be less than in many other cities, which gives the Los Angeles business man cause for congratulation.

Pacific Coast Merger of Widespread Interest

Creation of a new Pacific Coast paper and pulp merger, involving properties of an estimated book value of fifteen million dollars, was announced late in August by J. D. Zellerbach, president of the National Paper Products Company, subsidiary of the Zellerbach Paper Company, and R. S. Shainwald, executive vice-president of The Paraffine Companies, Inc.

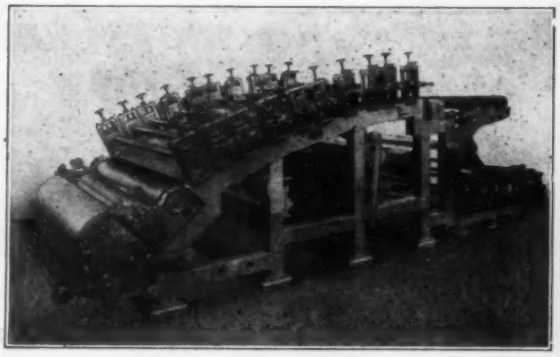
A score or more of plants operated by the two organizations in all parts of the coast territory, will be included in the combination. These plants are engaged in the manufacture of chemical and mechanical pulp, all grades of box board, the fabrication of corrugated and solid fiber shipping cases, folding and setup boxes, cartons, oyster and ice cream pails, paper tubes and cans. All the properties to be merged are now owned by and operated by the Zellerbach and Paraffine organizations in the same line.

Incorporation is planned under the laws of Delaware for the new concern, which will have a capitalization of 300,000 shares of preferred stock of $100 par value and 410,000 shares of no par common stock.

The Paraffine and Zellerbach interests enter the merger on an equal basis and will absorb all the stock of the new corporation without recourse to any public financing. It was stated that the deal, of which rumors have been current for some time in financial circles, will represent the advent of no outside interests.

The Zellerbach's contribution to the merger represents between 15 and 20 per cent of its $34,000,000 business. Paraffine Company throws into the combination a large proportion of its interests, although the total is considerably less than half its business. Its big roofing, floor covering and paint plants at Emeryville, on the East side of San Francisco Bay, will be operated independently of the combine, nor will its subsidiary, Schumacher Wall Board, be included.

The new company will employ about 2,500 people and produce approximately 500 tons of board of various grades daily, being one of the largest companies in the nation, in



NEW WALDRON

Arched Bed

Coating Machine

Affording all the advantages of the cylinder machine plus the ability to take all the brushes necessary for high speeds—in excess of present established inclined bed machine practices.

This new Waldron coating machine incorporates a straight line brush motion with an arched bed and improved drives to better handle wide goods at a high speed. The undue stresses and vibrations in running wide goods at high speed are eliminated by the extra heavy construction of the machine throughout. The usual trouble due to slack edge and wrinkling of goods has been overcome by the arched surface in conjunction with the many other major improvements in Drives, Rolls, Bearings, Adjustments and Lubrication. Where operating speed in addition to smooth coating is a requirement, the specifications and performance records of the Arched Bed Coater merit prompt investigation.

Waldron Machines For

Embossing & Printing
Winders, Slitters, Reels
Waxing, Gumming.
Sizing and Coating
Wall Paper Machinery
Sand Paper Machinery

Specialists in Designing, Fabricating and Installing Complete Factory Layouts for Floor Covering, Wall Paper and Coated Paper.

JOHN WALDRON CORPORATION

Main Office and Works - NEW BRUNSWICK, N. J.

208 West Washington St., CHICAGO
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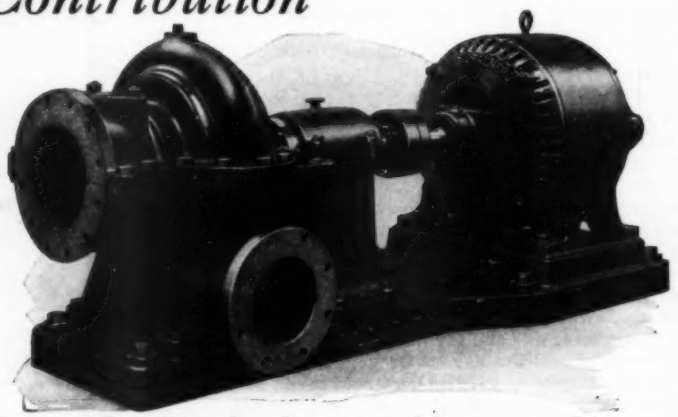
Allis-Chalmers Contribution to the successful handling of Paper Stock with better Efficiency

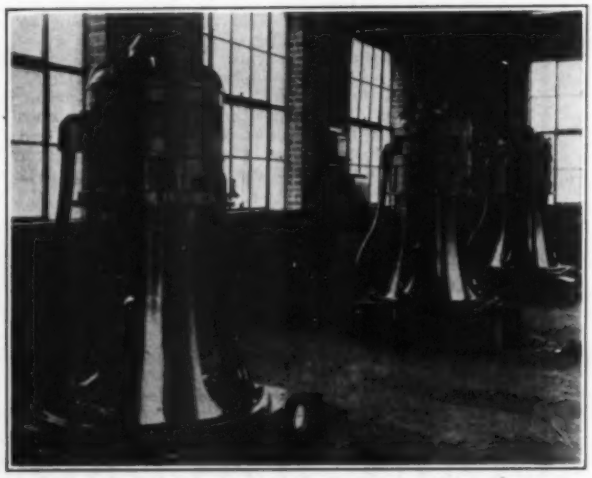


A New Paper Stock Pump, developed after working on this problem a long time until the pump met our ideas of what a good stock pump should be and do. The pumps will handle stock and are unusually efficient

ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

LAYNE WELL SYSTEMS FOR PAPER MILLS



Photograph shows three of the seven Layne Installations which serve the Louisiana Pulp and Paper Company of Bastrop, Louisiana.

Layne Well Systems will produce more water at less cost per thousand gallons than any other known method.

Layne dependability and low maintenance are outstanding features.

An inquiry will not obligate you in any way and may mean a Savings

LAYNE & BOWLER

INCORPORATED

HOUSTON MEMPHIS LOS ANGELES

this field. Most of its output will be used in original or fabricated form on the Pacific Coast.

The title of the newly formed company has not been announced. J. D. Zellerbach will be president and H. D. Patterson, general manager of the board and paper division of the Paraffine Companies, will be vice-president and general manager.

Creation of the company is expected to be a distinct advantage to both the parent companies as well as to the business in which it will engage. Great savings are expected to result from elimination of duplication and competitive costs and these, it is indicated, should be reflected in the earnings of the new organization.

At the same time Zellerbach and the Paraffine companies will be left free to concentrate attention on their own lines, which otherwise are non-competitive. The Zellerbachs already are doing some extensive exploration work in Southeastern Alaska and are building a new mill in the Pacific Northwest.

Reports of the forthcoming merger had a strongly bullish effect on the stocks of both Paraffine and Zellerbach on the San Francisco stock and bond exchange during recent weeks. Paraffine recently sold above $68 a share and Zellerbach up to $36, both new high prices on the present basis.

New Kelso Mill Making Progress

The Kelso Paper Co. which recently acquired a site for a mill at Kelso will begin construction of the plant about September 1, E. A. Knight, one of the trustees of the company announced on August 4.

Walter Clifford, who has been with the Crown-Willamette Paper Co., as consulting engineer, has resigned his position to take active charge of the affairs of the Kelso Paper Company as president and general manager. He plans to leave about August 15 for the East to arrange for shipment of machinery purchased for the plant and will return about September 1 to inaugurate construction work.

It is understood the building will be rushed to completion and the machinery installed, so that actual production of paper can be started by Christmas.

Fate or Good Fortune?

Great disappointment was felt by members of the Paraffine Companies, Inc., over the misfortune which overtook Major Livingston Irving, the firm's entry in the Dole air flight, just at the start of the event. As things turned out, however, Irving may have been fortunate that his trouble came on Oakland's air field rather than out at sea. Irving, war ace, now is a roofing engineer with the Paraffine companies, of which his father, S. C. Irving, is treasurer. When the young Major expressed a wish to participate in the San Francisco-Hawaii flight, members of the firm arranged to finance the expedition, to the extent of $20,000. Just about everybody in the organization had a part in it.

On the day of the flight, however, Major Irving's plane failed to rise in a satisfactory manner on his first attempt, and he voluntary brought it down to make a second try. The fuel load apparently was too great for the plane, however, and on the second attempt it crashed to the ground, breaking a wing. The plane was known as the Pabco Flyer. Irving was unhurt in the crash.

Bates Valve Bags Growing in Demand

More than a million and a half "multi-wall" paper bags are turned out at the new $300,000 Los Angeles plant of the Bates Valve Bag Co., of Chicago. These bags are made of western kraft paper and are sold and used in the west. Consumers include manufacturers of cement, plaster, poultry feed, magnesite, diatomaceous earth, fish meal, fertilizer, stucco, filter clay, fire clay, soda clay and coarser materials.

Eighty per cent of the new plant's output is the Bates five-wall valve bag, fitted with a patented self closing valve in one corner, through which the contents are poured. The rest of the product consists of open mouth bags of three, four and five walls, for coarser materials, which cannot flow

Ferguson
ENGINEERS

Design—Build—Rebuild
—Report—Appraise

POWER PLANTS *and*
COMPLETE PAPER MILL
• PROJECTS

One organization under one contract guarantees price, delivery date and satisfactory results.

Representative
Ferguson customers in the paper industry:

Hinde & Dauch Co.
A. P. W. Paper Co.
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MURRAY IRON WORKS
COMPANY
(INCORPORATED 1870)
BURLINGTON, IOWA

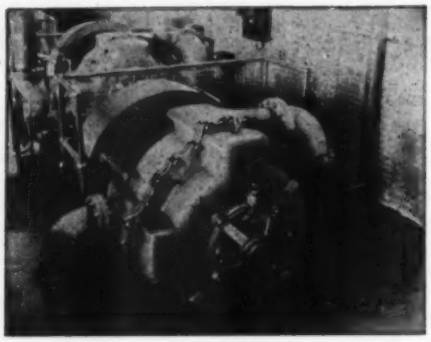
Successful Builders for 56 Years
of BOILERS *and*
ENGINES

PLEASE SEND US YOUR INQUIRIES

Engines	*Boilers*
CORLISS	INTERNAL - FURNACE
PUMPING	TUBULAR
UNA - FLOW	WATER - TUBE

Our Engine and Boiler Shops are quite independent of each other. ¶ And we Specialize on Boilers the same as we Specialize on Engines.

Use any form of drive on a Nash



Two Nash Hytor Vacuum Pumps, sizes No. 6 and No. 7 capable of handling 770 and 1192 cu. ft. per min. at 12 in. vacuum, respectively, installed in the P. H. Glatfelter Paper Co., Spring Grove, Pa.

The starting load on a Nash Hytor Vacuum Pump is unusually light. The torque is uniform. As a result, any convenient form of drive is permissible.

This and the many other features of Nash Pumps for removing water and air from flat boxes, screens, suction rolls, felts, dryers, and similar equipment are fully described in our bulletins. Copies free on request.

NASH ENGINEERING COMPANY

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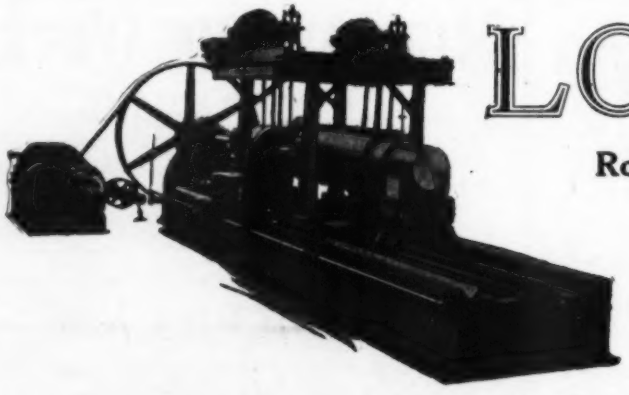
Nash Hytor

VACUUM PUMPS AND COMPRESSORS



LOBDELL

Roll Grinding Machines

Full Motor Driven
Rapid
Accurate
Long Lived

The automatic crowning device and the provision for leveling the bed are exclusive features of the Lobdell Roll Grinders.

The design and operation are fully described in our booklet "Grinding, Care and Upkeep of Paper Mill Rolls."

LOBDELL CAR WHEEL COMPANY

Established 1836

WILMINGTON, DELAWARE

through the valve. The development of this company's business on this coast has all been within the past seven years, and has been described as meteoric.

Wollenberg Interprets Longview's Position

H. L. Wollenberg, president of the Longview Fiber Co., in connection with the announcement that the company, at Longview, Wash., would add a paper machine to its kraft pulp mill now under construction, has pointed out the necessity of taking into consideration factors of advantageous wood, water, power and fuel supplies, shipping facilities and financial resources in building a pulp or paper mill.

"It is hoped that the Longview Fiber Company's action in extending its project in Longview will not be interpreted as endorsement of the wave of paper mill construction which has reached epidemic proportions in the Pacific Northwest," Wollenberg said.

"World production capacity for pulp, newsprint and sulphite paper already exceeds consumption and over-production of all grades is inevitable if even part of the new projects are really carried out.

"Use of sawmill waste as a basis for pulp and paper production is a chimera unless a suitable grade is available continuously in sufficiently large quantities to operate a pulp and paper mill of economic size. On ordinary grades of paper the economic size of a mill is certainly well above 100 tons a day. It is a common mistake to overestimate the amount of sawmill waste available from a given cut of lumber and to seriously underestimate the cost of gathering, transporting, preparing and shipping the waste.

"To survive inevitable and severe domestic and foreign competition, mills must be very advantageously situated as to supply of wood, fresh water, fuel, power, labor and rail and marine shipping facilities. To all these conditions must be added the financial resources and technical skill which are needed in such large measure in this particular industry. The marketing of the output is also a major problem, as channels of trade in the paper industry wear deep and new producers who do not control marketing outlets sell their product only with difficulty and often with serious sacrifice of price and profits.

"This company is increasing its output to round out its development to an economic size and to realize on what it believes to be its exceptionally favorable situation in all essential factors."

West Lumber and Pulp To Build Mill

The West Lumber and Pulp Co., is the name of a newly organized concern that will erect a 100-ton bleached sulphite pulp mill at Junction City, a mile east of Aberdeen, Washington. The plant is to be erected on the site of the old A. J. West sawmill property and will be operated in connection with the West mill, according to an announcement made in Portland recently. The company is being incorporated for $2,500,000 and the first unit is to employ approximately 350 men at the start.

C. W. King, a New York capitalist who is connected with the Du Pont interests has been named president of the company; B. T. McBain, Portland pulp and paper expert, vice-president; W. E. Johnson, Montesano banker, vice-president; A. B. Clements, Washington, D. C., Chief council.

Mr. McBain drew up the plans for the pulp company and will act as general manager. Watson A. West and his brother, Edward West, will retain interests in the company and will have important duties in connection with the operations of both the lumber mill and the pulp plant. Auditor for the concern will be J. E. Fowler.

The announcement stated that construction was expected to begin as soon as articles of incorporation were completed and filed, with the plant ready for operation inside of a year. Both the sawmill and the pulp mill are to have frontage on the Chehalis River and a large warehouse at the river will make possible the loading of ships directly from the storerooms. Land shipments will be made possible by the construction of a spur track.

Bond and book paper mills of the east are to be supplied

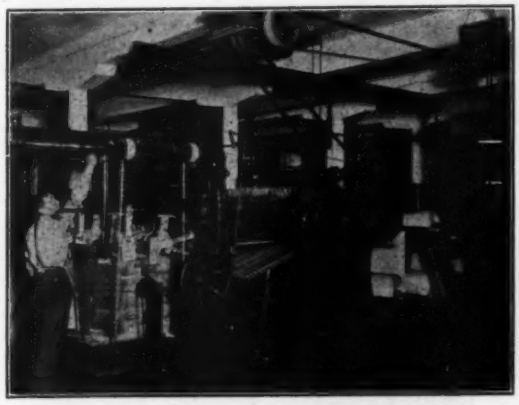


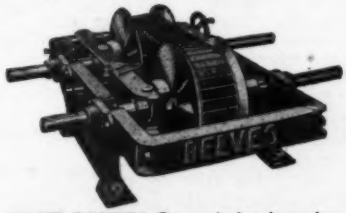
Photo shows a REEVES Transmission driving a paper cutter at the Southworth Company, Mittineague, Mass.

Accurate, Steady Graduations *of* Speeds!

THOUSANDS of paper manufacturers all over the world have eliminated waste in production by installing the REEVES Variable Speed Transmission and getting *accurate* speed control.

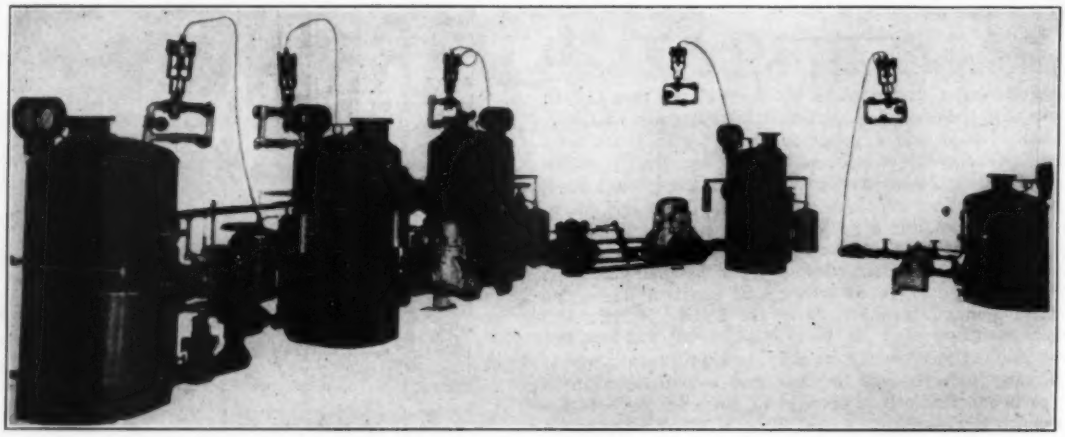
For instance, when a REEVES operates a paper cutter, the feed rolls run at a constant speed, and the speed of the knife is regulated to cut exactly the length of sheet desired. This simple, inexpensive device will run at any speed described between fastest and slowest so you can cut any length sheet at any time. Send for our catalog A-66 which gives full information.

REEVES PULLEY COMPANY
Established 1887
COLUMBUS, INDIANA



THE REEVES Transmission is a simple, compact mechanical device which receives power at a constant speed and delivers it at any speed desired to any machine or group. It will maintain one set speed indefinitely, or may be changed instantly to meet any different operating condition. Accurate and dependable, always.

REEVES
Variable Speed Transmission



One Shipment

Increased drying efficiency is being secured in paper mills throughout the country with the improved Fulton dryer drainage System. The picture shows five Fulton Circulators ready for shipment. Your drying can be improved by our practical experienced paper mill engineers.

Better sheet—More production—Lower cost

Fulton Engineering Co., Middletown, Ohio

Even the little leaks are wasteful

Even little leaks are wasteful. On a steam line for instance, if they continue unnoticed you can be sure a steady fuel waste continues, too. Don't wait for these leaks to grow larger and larger until they almost shout aloud for packing. Go over your plant—the very first chance you get—and pack joints to *stay*—with Jenkins Packings.

Jenkins Packings are leak-stopping materials that have proved their worth in the many fields. Made of the highest grade rubber and other carefully selected ingredients, and compounded with great care.

If you want packings that do not crack, crumble, or squeeze out at the joint, send for your copy of the Jenkins Packing and Gasket folder.

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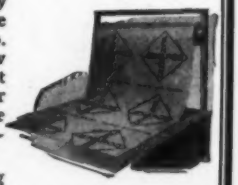
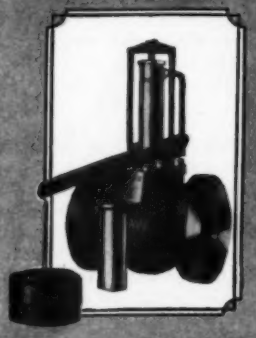


Jenkins Packings include JENARCO, a red vulcanized packing for hot and cold water and saturated steam, JENKINS '96, a black unvulcanized packing for hot and cold water and saturated steam at all pressures, OIL-TITE, as its name implies for oil service, and COMPRESSED ASBESTOS JOINTING for high pressure superheated steam.

JENARCO — Jenkins Packing — 96 96 96 96 96 96

VALVE MAKERS FOR OVER FIFTY YEARS



THE DESIGN of the Davis Pressure Regulator is based upon full knowledge of all the requirements of modern generation and use of steam.

Wherever boiler pressure must be reduced to the correct service pressure for auxiliaries, heating, and process uses of steam, Davis Regulators maintain the exact lower pressure automatically under all conditions of operation.

The Davis Regulator is sensitive and accurate, and is not affected by high velocity steam. Pressure is counterbalanced by weight, and the action of the regulator is visible. The engineer can test a Davis Regulator by hand as often as he likes. Send for the Davis catalogue and get all the details.

DAVIS VALVE SPECIALTIES
STEAM SAVERS SINCE 1875

G. M. DAVIS REGULATOR CO., 422 Milwaukee Avenue, Chicago, Ill.

P19—Gray

with raw material from the West Lumber and Pulp company through the trading firm, Pulp and Paper Trading Co., 21 East Fortieth St., New York, of which J. Anderson is president, the announcement stated. The mill will manufacture the highest quality of bleached sulphite pulp for this purpose.

The reorganization of the West lumber company which has been closed since the failure of the Hayes & Hayes bank last February, means that the mill will be in operation again about October 1st. Only hemlock logs are to be cut so that mill ends will be used for pulp wood.

Port Townsend Responds to Industry

How Port Townsend, Washington, acquired a kraft mill of the Zellerbach interests, through the efforts of Ed. Sims, well known resident of that place and the cooperation of other live wires in town, is being discussed on the Pacific Coast as an evidence of what can be done by an agitated community spirit.

After an incipient boom in the late eighties, during which Port Townsend, on the northeastern tip of the Olympic peninsula, was heralded as a coming metropolis, the growth failed to come and for decades the town was virtually a ghost city, with some big buildings erected in the enthusiasm of an earlier day, but only a few inhabitants, mostly on the federal payroll in the immigration or customs services or in the army.

But earlier this year came tidings that the Zellerbach people were looking over the town as the location for a $2,500,000 kraft mill. From the standpoint of harbor advantages, wood resources and other considerations, there seemed to be a good chance that Port Townsend would win the mill. But it developed after investigation by the Zellerbachs, that the town had no water to offer, and consideration of the site was abandoned.

Then came Ed. Sims, who knew that water could be furnished if Port Townsend would give a favorable vote to a proposition to spend some $800,000 to bring in an industrial water supply. He hastened to San Francisco, but was told by the Zellerbach officials that water bonds required an election, with consequent delay and the Zellerbachs wanted to get started on this mill.

Sims said he would have, within a week, a guarantee from the citizens which would serve to underwrite the water bond issue up to the time of the election. He was granted the week.

He wired his colleagues in Port Townsend to hustle around and get quick results. They got out handbills for a mass meeting and when Sims got back the town was out en masse to hear how it could get this really big mill. He told them and they responded by pledging that they would vote for the water bond issue. Ninety per cent of the qualified voters, 915 men and women, signed this pledge.

On July fifth the Zellerbachs in San Francisco received a 3,000 word telegram from Ed. Sims in Port Townsend. It contained the names of all the 915 signers of the pledge.

Port Townsend got the mill.

Hawley Constructing Warehouse

The Hawley Pulp and Paper Co., of Oregon City, Ore., have begun construction of a one-story warehouse, 100x200 feet which is to be erected on a site of land located in Portland. It is to be of mill and concrete construction, designed especially for the storage of print paper, and is to be used as a distributing point for the Hawley company to Portland consumers. It is expected that the structure will be completed by the first of November.

W. P. Hawley, Sr., head of the Hawley Pulp and Paper mills has left Oregon City with his wife and grand daughter for New York and Europe. They intend to remain away for the remainder of the year and will visit Great Britain, France, Germany, Italy, Switzerland, Spain, Morocco, Egypt, the Orient and other points. They sail on the S. S. Paris.

Earnings for the Crown-Willamette Paper Co., in the second quarter of this year amount to $661,053.84, as compared with $625,982.66 for the second quarter of last year

PERKINS HOLYOKE

Calender Rolls

More than Fifty Years Successful Service

Since 1873, Perkins Calender Rolls have been known with favor to the paper industry. They have been designed and built to meet the exact requirements of paper makers. Perkins Calender Rolls have marked individuality because of special methods of manufacture that these long years of service in this field have developed. Perkins Calender Rolls are uniform, resilient and resistent, the three essentials most important to the paper manufacturer.

Perkins Calender Rolls stand heat better and wear longer. They are made in the world's largest Calender Roll plant in which have been developed special mechanical processes for preparing filler stock, which means uniform and long life to the product.

B. F. Perkins & Son, Inc., Holyoke, Mass.

TRADE MARK REG. U.S. PAT. OFF.

COTTON ROLLS - PAPER ROLLS - EMBOSSING ROLLS - CHILLED IRON ROLLS - GRANITE PRESS ROLLS - WEB SUPERCALENDERS - GLASSINE SUPERCALENDERS - FRICTION CALENDERS EMBOSSING CALENDERS - SHEET CALENDERS - PLATERS - MULLEN PAPER TESTERS TENSILE TESTERS - VENTILATING FANS - RAG CUTTERS - STOCK CUTTERS - PAPER DAMPENERS BLEACH EJECTORS

When Minutes are Money

~ once is enough to join a Belt

It Pays to **STANDARDIZE!**

"—since becoming familiar with Crescents I have never used any other form of fastener."

"—We have used your fasteners throughout the plant—entirely satisfactory on all our drives."

"We have discarded everything in favor of Crescents."

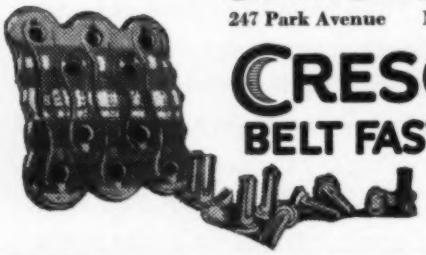
"—found them satisfactory and have standardized the use of Crescent Belt Fasteners on all of our belts."

"During the last six years we have used Crescent Belt Fasteners exclusively."

"—such satisfactory service that we now use them exclusively."

Write for Catalog

CRESCENT BELT FASTENER CO.
247 Park Avenue New York, N. Y.



CRESCENT BELT FASTENERS

Recommended by Belting Manufacturers

FOR PERMANENCY OF INSTALLATION

Powell Valves

are for most

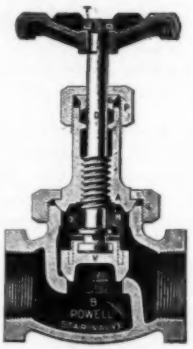


Fig. 110
Model Star Globe Valve, 200 pound Extra Heavy for 300 pounds W.S.P. size ¼ to 3 inches.

Powell Regrinding Model Star Valves are especially adaptable where conditions demand long uninterrupted service and accessibility to regrind the disc in the event of wear or seat injury without removal from the line.

These valves are cast of a high grade steam bronze. The bonnet and trimmings are joined by means of a ground union joint held fast by ring nut. This provides a substantial connection and easy access to disc and seat when necessary. The disc slides over the head of stem to a socket eliminating a lock nut and permitting it to swivel freely.

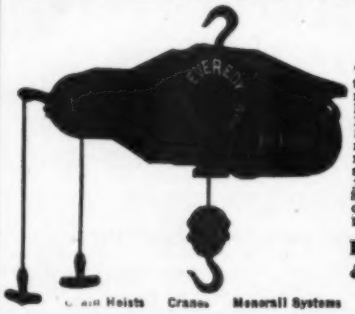
Powell Valves and Engineering Appliances are sold and stocked by competent jobbers everywhere.

THE WM. POWELL CO.

CINCINNATI, OHIO

500 lb. Electric Hoist

$225.00



This Everedy Hoist is the most accessible hoist made. Light—500 lb. hoist weighs 225 lbs.; 1000 lb. hoist 250 lbs. Speedy — 40 feet per minute A. C., 25 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

READING CHAIN & BLOCK CORP.
READING, PA.

Hoists Cranes Monorail Systems

GRANT GEAR WORKS

Estimates and gear advice promptly and cheerfully given

Send for Our Catalog of Stock Gears

Office and Works
Second & B Sts., Boston, Mass.

"TWENTY TIMES FASTER THAN BY HAND"

For lifting paper rolls, removing calender rolls or raising Fourdrinier wires, use ROEPER Type "R" Electric Hoists—With or without Trolleys—Speeds up to 40 feet per minute—Send for Bulletins.

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1724 North 10th Street READING, PA.

THE JOHNSON FRICTION CLUTCH

USE JOHNSONS ON YOUR NEXT PAPER MACHINE

Write for Catalog "P. I."

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

and $607,274.22 in the first quarter of this year, according to a recent statement issued in financial circles in Portland, Ore.

BRITISH CORRESPONDENCE

Advertising Exhibition Huge Success

"From Pulp to Purchaser—from the pine forests to the letter box" was the story of successful advertising as told by the Daily Chronicle, on its stand at the Advertising Exhibition held in London last month. The evolution of newsprint paper was demonstrated by pine logs, bales of wood pulp, the paper reel, the lay-out of a printed page, a modern linotype machine, the form, the corrected proof, the matrix, the rotary stereo plate, and the finished newspaper as purchased everyday. Although there are over two hundred and fifty paper mills in Great Britain, only one was represented at this Exhibition—the Daily Telegraph paper mills. On this stand were shown various examples of the mills specialties in paper. Originally built and equipped to make newsprint for its own paper, this mill has in recent years developed as a maker of white and tinted banks, and imitation parchments, and is now competing for lines which were previously mostly imported from Continental and American mills. From the outset, the tints and qualities produced at this mill were standardized, and mill stocks were made up in popular sizes and weights, ranging from substance of manifold bank to large post 18 lb.

Progress on Machines

The development of wider machines for papermaking has been of considerable importance during the last few years in this country, and the demand for wider fabrics has resulted. The Manchester Guardian Commercial reports that looms under present construction by Messrs. Hindle, Son, & Co., Ltd., of Haslingden are capable of supplying fabrics for the largest paper machines at present in existence. These looms which are specially adaptable for the weaving of papermaker's felts range from 102 inches to 275 inches reed space according to requirements.

Furthermore the suitability of the structure of the fabric in relation to its ultimate use has been closely studied. The fabrics which are entirely of cotton, used for the above purpose, are of the multiple type, an average weight being 5½ oz. per square foot. The warp which is usually a 7's fivefold with 60 ends per inch, is drawn from a bobbin creel by way of tension rods and nip rollers, while the weft (of similar count) is inserted with 33 picks to the inch.

Shedding is effected positively by means of steel tappet plates (cut automatically) situated at the loom side and arranged to control four or eight wire healds according to requirements. The tappit gear itself is designed to permit easy and expeditious adjustment, being constructed as a detachable and interchangeable unit, whereby five tappet plates suffice for eight shafts, the exterior plates being single faced, and the interior plates double-faced. The beating up for such heavy and specialized fabrics, which are attained by the location of cranks at intervals of 54 in. has involved much attention.

Further features worthy of note are the flywheel application to the crank-shaft, direct gear drive from individual electric motor (15 horse power), and fast reed knock-off motion. The woven fabric is taken direct to the paper machines without any intermediate operation. In addition to a number of looms in use in this country, there are others in Germany and Canada.

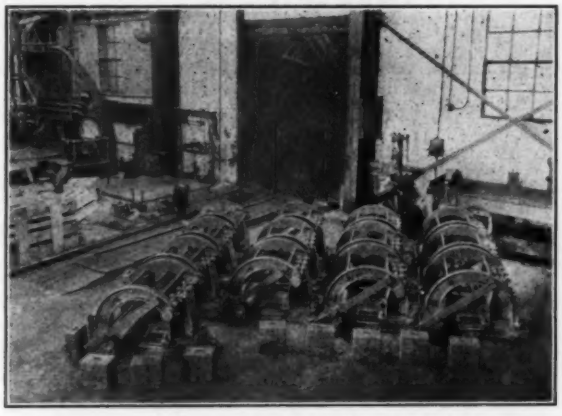
The Ever Interesting Bamboo

James Strachan, has furnished some valuable information, supplementing that already available on the use of bamboo pulp as a possible paper-making material to replace sulphite wood pulp.

He is reported in the Newspaper World as saying that many years ago he assisted in the preparation of bamboo pulp for the first run of bamboo paper on a fairly large scale. The paper maker was in some doubt as to the treatment he

The LENIX Drive

(Trade mark Reg.)



125 Horsepower Lenixes for Battery of Beater Drives in Paper Mill

Repeat Orders *Mean* Satisfaction *and* Confidence

Complete and lasting satisfaction with equipment already furnished; confidence in the ability of the machinery manufacturer to produce the best equipment for the work to be done:

These are the factors which produce **repeat orders** and which moved one of America's foremost paper manufacturers to purchase Lenix Drives. Various other drives were considered —some lower in first cost—but Lenix Drives were chosen because past performance of Lenixes in that company's plants proved that efficient, economical and reliable drives would be obtained with Lenixes.

This paper company is only one of many from whom repeat orders are regularly received.

The Lenix is the **pioneer** short center belt drive. More than **eight thousand** Lenixes are now installed in practically every industry. A number of these Lenixes are still in daily service after more than twenty years of operation.

The Lenix Saves

Floor space
Belting
Bearing friction
Lubrication

On Drives 1—1400 H. P.

Get the facts on LENIX. A card will bring you full information.

F. L. SMIDTH & CO., Inc.

Engineers

50 Church St., New York, N. Y.

Protect your Motor and Machinery —

From Destructive Vibration and the Twist and Strain of Initial Overloads with—

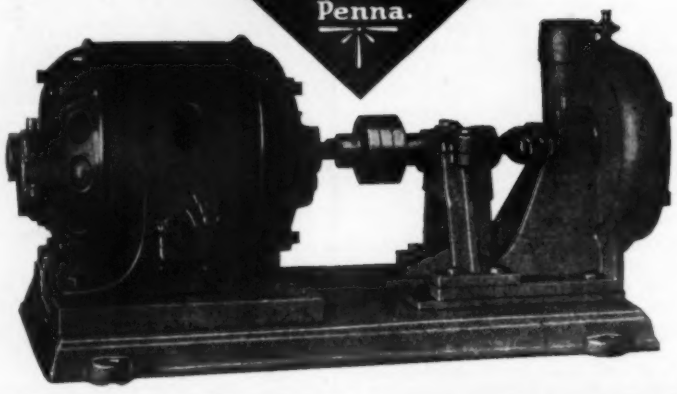
WOOD'S FLEXIBLE COUPLINGS

The multi-ply leather disc sandwiched between two specially designed cast iron flanges harmlessly absorbs all punishment, thus saving your motor and direct connected machine all wear and tear. Write for our bulletin describing the construction and numerous applications of Wood's Flexible Couplings.

T.B. Wood's Sons Company,
Chambersburg, Penna.

Wood's Power Transmission Machinery—

Shafting
Hangers
Couplings
Rope Drives
Friction Clutches
Pulleys
Pillow Blocks
Belt Contractors
Speed Reducers
Conveyors
Ball Bearings, etc.



Rumsey Open Impeller Centrifugal Pumps for direct motor drive, similar to the illustration, are equipped with Wood's Flexible Couplings ready for motor.

These small centrifugal pumps are suitable for low head duty where capacities up to 100 gallons per minute are involved.

POWER PLANT PIPING

We are fully equipped to supply fabricated materials and to install complete piping systems for Electric Power Stations, Blast Furnaces, Steel Mills, Coke Works, Paper Mills and Industrial Plants of every description—backed by an experience of almost a quarter century.

Pittsburgh Piping & Equipment Co.
PITTSBURGH, PA.

Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
Steel Transmission Towers

RITER-CONLEY COMPANY
General Offices, Pittsburgh, Pa.

ESOTOO

Trade Mark Reg. U. S. Pat. Off.

LIQUID SULPHUR DIOXIDE
In Tank Cars

Will Enable You to Maintain Uniform Sulphite Liquors

as an **Antichlor**

for bleached pulp it has no equal

VIRGINIA SMELTING CO.

Works: West Norfolk, Va.
C. W. Johnston, Manager

F. A. EUSTIS, Secretary
131 State St., Boston, Mass.

MAGIC BOILER PRESERVATIVE

"The Pioneer Boiler Treatment"

Positively removes and prevents scale, stops minor leaks, pitting and corrosion

GARRATT-CALLAHAN CO.
410 South Michigan Avenue, Chicago

148-156 Spear St.
San Francisco

MAGIC
ESTABLISHED 1904

1328 Broadway
New York City

PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

WYCKOFF WOOD PIPE

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained

WRITE TODAY FOR CATALOG AND PRICES

A. WYCKOFF & SON COMPANY
1855 Elmira, N. Y., U. S. A. 1927

should give it in the beaters. He was a man of wide experience but had not handled bamboo before. Mr. Strachan's advice was, "beat the bamboo pulp just as if you had a mixture of equal proportions of these three pulps in the engine." He did so and the machine ran without a hitch.

The report goes on to point out that at the present day the paper maker has no reason to doubt the excellent paper-making qualities of bamboo pulp, or his ability to deal with it without involving himself in practical difficulties. Bamboo works as a natural blend of sulphite, esparto, and straw, and yields a paper more bulky and opaque than pure sulphite papers, less so than pure esparto papers, and quite as strong as the average sulphite paper. Mr. Strachan says that while it appears probable that wood pulp will become less plentiful in another generation, it is equally certain that the next source of raw material to be tapped in Canada and America will be the straw of cereals. At present the straw from cereals burned annually contains twice the world's cellulose requirements. The bamboo proposition, as put forward by Mr. Raitt, however, is of more immediate interest to the British paper maker. Mr. Raitt states that he can give the British papermaker easy-bleaching bambo cellulose at £12 a ton, as against £14 for the equivalent grade of wood cellulose. If this can be done, it will certainly give the British papermaker a new advantage in the world's market for fine papers.

The testimony to the value of bamboo pulp for paper-making purposes, coming from one who is himself a practical papermaker, and gave the pulp a trial when it was still in its experimentary stage, should help to bring what appears to be a very valuable raw material more speedily upon the market. British papermakers are recognised to be amongst the best that there are in the world, but they are like many other British manufacturers, naurally conservative. One wonders whether they will take the opportunity that they now have to acquire a hold upon what appears to be an efficient substitute for wood pulp, or whether they will let it slip into the hands of others, and allow the more progressive papermakers of other countries to reap the benefit.

General conditions in the paper trade are not improving, and merchants are finding it more difficult to get orders than the mills. With demand so much below supply, keen price competition is the order of the day. Imports are steadily advancing, while exports are losing ground at the same rate.

British Paper Trade Figures

Exported During July

	1925	1926	1927
Paper and cardboard, cwt...	468,682	418,034	298,951
Papermaking materials, tons.	16,015	17,260	13,963

Imports During July

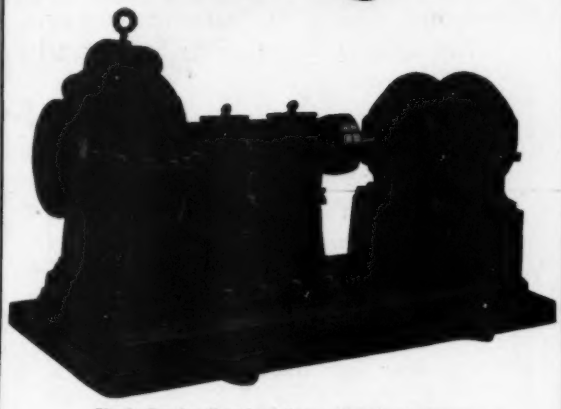
	1925	1926	1927
Paper, cwt.	1,308,271	1,676,823	1,346,238
Wood pulp, tons,.....	116,829	124,427	136,779

Controversy on Wrapping Paper Duty

Controversy is again raging in regard to the wrapping paper duty. Many merchants whose business was formerly almost entirely in imported papers, are not pleased with the working of the duty. Imports have naturally decreased, and some of them have considerable financial interest in foreign mills, and it goes against the grain to recommend British papers in place of foreign. On the other hand, from the manufacturers' point of view, it has been pointed out by one mill manager, that, prior to the duty, British mills had to be content with orders for one or two tons of a size, weight, and quality.

Now that the orders are so much more plentiful, they can get runs of ten or more tons at a time, and thus reduce the cost of production, and improve the quality, with a consequent reduction in prices, and with a lower selling price, the mills have been able to pay a reasonable dividend, whereas, before the imposition of the duty, it was often a case of working at cost, and sometimes at a loss. Business in this

Frederick
Centrifugal
Pumps



Single-Suction Standard Paper Mill Stock Pump

Insist on Split Sleeve Bearings in Your Pumps

Split sleeve bearings are standard construction in all Frederick Pumps above 1½" discharge. The reasons for using this type of bearings are:

1. They are easily replaced. Simply remove the bearing cap and roll the bearing out. The pump doesn't have to be torn down.
2. They give the shaft wide supporting surfaces. The shaft does not rest virtually on knife-edges at each end.
3. They are covered by an oil film that provides a cushion for suddenly applied loads and shocks.
4. They give long wear, without requiring attention. A slight impairment will not appreciably affect the operation of the pump.
5. They are easy to repair. A babbitt bearing can be made in the field by an ordinary mechanic.

When roller-bearings or ball-bearings are specified for some special reason, they are furnished in Frederick Pumps at no additional cost.

Our Standard Stock Pump handles stocks of consistencies up to 4% with excellent efficiency. Our Super-Stock Pump will efficiently handle 6% stock.

There is a Type of Frederick Pump Suitable to Every Need of a Paper-Mill

The Frederick Iron & Steel Company

Frederick, Maryland

In Canada:
Dominion Engineering Works, Ltd., Lachine, Que.

FOR ALL PAPERS—

A Fitchburg Felt

¶ For whatever paper you make, whether fine ledger or bond, book or coarse paper, Fitchburg Felts give long and efficient service.

¶ Fitchburg Cotton Dryer Felts are made in two, three, four, five and six ply in English weave, from 60 to 210 inches in width.

¶ *When next thinking of dryer felts, think of "Fitchburg."*

FITCHBURG DUCK MILLS
ESTABLISHED 1844
54 Duck Mill Road FITCHBURG, MASS.

1864 1927

"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Sold by
BULKLEY, DUNTON & COMPANY
75-77 Duane Street, N. Y.
and direct

RUSS GELATIN CO.
WORKS—WESTFIELD, MASS.

MANUFACTURERS OF

GELATIN and GLUE
ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON
FINE WRITING PAPER SIZING

E. F. RUSS COMPANY 287 Atlantic Avenue BOSTON, U. S. A.

No Friction "drag" with Daniel's P. P. P.

Engineers know that Daniel's P. P. P. Rod Packing maintains a steam-tight cylinder and adjusts its bearing to suit the changing pressures in the cylinder.
P. P. P. gives long wear, is thoroughly efficient, and is easy on the rod.
If your dealer cannot supply you promptly, write us.

QUAKER CITY RUBBER CO.
Main offices and factories
WISSINOMING, PHILADELPHIA
Branches: New York, Chicago, Pittsburgh, San Francisco.

Ham Feltz sez:

"When I go out to buy some rubber bands I wants those as stretches the most. But when I get felts, I want those as hasn't any more stretch than a dollar bill in a big family. Started right, Hamilton Felts don't stretch much at all. They're made better so they stays full width until it's time for the rag man to cart them off."

Hamilton Felts

It pays to use the Opportunity Section for Classified Advertising

See Page 1022 of this issue

line has improved considerably at home, confidence is restored, and tens of thousands of pounds have been invested by the wrapping mills, during the past year, in putting down new plant and machinery.

Woodlands Section Has Interesting Trip

The start of the summer trip of the Woodlands Section of the Canadian Pulp and Paper Association was made from Montreal, August 1, to the Lake St. John region via the St. Lawrence and the Saguenay rivers. There were fifteen in the party. At Quebec they were joined by many more, and some even picked up at different points en route.

The first stop for inspection was at Price Brothers & Company, where motor cars met the party, and they were taken to Ste. Anne's ferry wharf to cross the Saguenay to Ste. Anne's where cars were waiting. Passing the northwest branch of the River Valin gave the members an opportunity to inspect the company's Valin shipshaw flume, which conveys the logs from below Bras Louis on the Valin to a pond above Chute aux Galets. The Chute aux Galets Hydro Electric Power development on the Shipshaw River was also taken in, and then the party left for Kenogami. Upon arriving at Kenogami, the party visited the burial place of the late Sir William Price who lost his life in the memorable landslide of 1924. While in Kenogami the party visited the paper mill and were given an opportunity to inspect the Minton vacuum dryer that is creating so much interest in the newsprint industry.

The new town of Arvida, home of the Aluminum Company of Canada, was also visited, and an interesting inspection tour of the plant made under the guidance of the general manager.

Riverbend was taken in as the next stopping place, and from there the party drove to Isle Maligne, where the Duke-Price power developments were inspected.

The next trip was the inspection tour of the paper mill development of the Lake St. John Power and Paper Co., at Mistassini. Other spots of local interest were taken in during the day.

Although not included in the formal program many technical discussions took place during the meeting, and the Executive Council of the Section took advantage of the meeting in planning a program of research work for Mr. Koroleff, logging engineer.

Of special mention is the way in which the entire trip was handled, and the cordial invitation as extended by Price Brothers, with nothing lacking in hospitality to make the meeting one that will long be remembered.

Farrel Foundry and Birmingham Iron Foundry to Merge

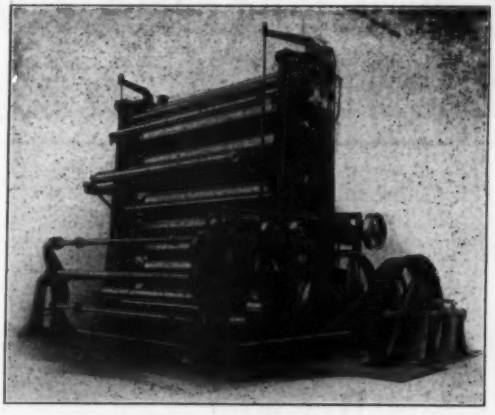
Notices have been forwarded to the stockholders of the Farrel Foundry and Machine Co., of Ansonia, Conn., and the Birmingham Iron Foundry of Derby, Conn., to the effect that the directors of the above companies recommend that the two companies be merged, and calling of a meeting on September 20, at which time the stockholders will vote on the question.

No radical changes are contemplated and it will be the aim of the new organization to operate the plants of both companies to the fullest capacity possible.

Both the Farrel Foundry and the Birmingham Foundry are believed to be the oldest concerns continuously in business in their respective cities and having the longest corporate existence. The Derby concern came into existence in 1836 while the Farrel Foundry and Machine started in 1848. The combined number of employees of the two concerns is over 1600.

The new concern will do business under the corporate name of the Farrel Birmingham Machinery Corp., and will be incorporated under the laws of the state of Connecticut.

William E. Brown, manager of the central station department of the New York District of the General Electric Co., has been appointed New York district sales manager of the company. His headquarters will be 120 Broadway, N. Y. C.



Saving Money On Machinery

IF YOU are interested in saving money on machinery—and who isn't?—you will be quick to realize that the sturdy construction and common sense features of Norwood dependable paper mill machinery and water filters are real money savers in the long run. Norwood quality and Norwood dependability are inbuilt qualities.

Note These Important Features!

NORWOOD CALENDERS

Continuous oiling system, top and bottom boxes removable without taking cap off calender frame—and many other features for efficient, easy and speedy operation.

Dependable

NORWOOD FILTERS

Three unit system, making continuous operation possible. All cast-iron pipes and connections. Patented separate air wash system and strainer system.

Dependable

NORWOOD PLATERS

All gears machine cut in our own factory; flexible coupling; dial type indicator; back shaft and intermediate shafts babbitted with genuine babbitt; operated with extreme simplicity by hand switch instead of lever.

Dependable

It will pay you to write us for full specifications, illustrations and prices on any paper mill equipment in which you are interested.

NORWOOD

ENGINEERING COMPANY

FLORENCE, MASS.

FILTERS SUPER-CALENDERS GLASSINE-CALENDERS PLATERS DUSTERS BRUSHING ENGINES

If you are in the market for any used paper or pulp Mill machinery, write to us. We have at all times, good used paper machines, calender stacks, beaters, Jordans, Rotary and Flat Paper Cutters, Slitters & Rewinders, etc., etc. We also would be glad to have your list if you have any good used equipment for sale.

Address:-

Gibbs-Brower Co., Inc.

Paper and Pulp Mill Brokers
261 Broadway, New York City
Telephone—Barclay 8020
Our Motto: *"SERVICE FIRST"*

Soda and Sulphate Pulp Mill Machinery
Mount Continuous Causticizers and
Pulp Washing Systems

SWENSON EVAPORATOR CO.

(Subsidiary of Whiting Corporation)
Main Office and Works - - - Harvey, Ill. (Chicago Suburb)

WE WILL SELL

American Writing Paper Co. 6s	@	84
American Book Company	@	148
British Columbia Pulp & Paper 6s	@	91
Cady Lumber Co. 6½s, 1936	@	93
Donnacona Paper Co. 6s, 1940	@	102
Donnacona Paper Co. Common	@	75
Dryden Paper Co. Ltd.	@	14½
De Jonge (Louis) Paper Co. Pfd.	@	97
Eastern Manufacturing Co. 7s, 1938	@	91
Eastern Manufacturing Co. Pfd.	@	29
Filer Fibre 7s	@	98
Great Northern Paper Co.	@	65
Hoberg Paper & Fibre 7s, 1937	@	96
Marinette & Menominee Paper 7½s, 1936	@	104½
Mengal Co. Pfd.	@	89
Minnesota & Ontario Paper 6s, 1931	@	98
Parker Young Co. 6½s, 1944	@	98
River Raisen Paper Co. 6s, 1936	@	99
St. Regis Paper 6s, 1931	@	101
Stevens & Thomson Paper 6s, 1942	@	96
Tait Paper & Color Works 6s, 1934	@	94

H. D. KNOX & CO.

44 Broad St., N. Y. 27 State St., Boston

Inquiries invited on all Paper Pulp Lumber Securities

FOR SALE—6 used Jones Imperial Jordans, with bronze or steel fillings. Will sell "as is" or factory rebuilt. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

EXPERIENCED CHEMIST wishes new connection with paper mill. References. Address Box 132, The Paper Industry.

PAPER MAKING and PRINTING MACHINERY DESIGNER open after Sept. first. Long, practical experience designing and perfecting such equipment with a number of years selling castings to the trade. Box 133, The Paper Industry.

Pickles' Patent
Automatic Steam Regulator
FOR
Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES **Buckland, Conn.**

PAPER MILL MACHINERY

One 72" Pusey-Jones Fourdrinier Part. Takes wire 74" by 50 ft.

One 129" Hamblet duplex sheet cutter with layboy and six roll stand.

One 134" Pusey & Jones Uniform speed reel.

One 130" Moore & White four drum winder with slitter attachment.

Three Beloit triplex stuff pumps 10x20.

Two Pulp breakers, Noble & Wood, 1200 lbs.

Four beaters, Horne, 54" x 48" with wood tubs.

All above equipment in excellent condition, installed new in 1923.

51 Dryers 36" x 72" with frames, felt equipment.

One reel, two drum upright.

One 68" duplex sheet cutter, Downingtown.

One 72" Moore & White four drum winder.

Three Dayton beater rolls 66" x 60".

Two 72" Baker wet machines.

Two 3 pocket grinders with sones 54" x 27" direct connected to G. E. motor, 2200 volts, 60 cycles, 240 r.p.m.

For Sale By

FRANK H. DAVIS COMPANY

175 Richdale Avenue, Cambridge, Mass.

Market Quotations

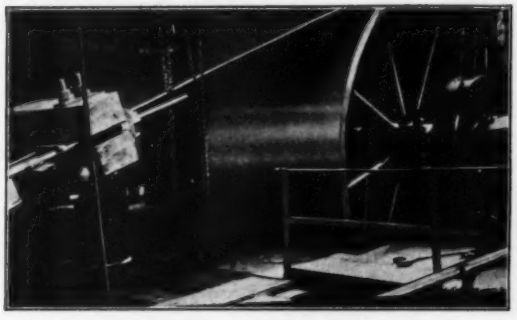
Issued by H. D. Knox & Co., 44 Broad St., New York

The quotations mentioned below are more or less nominal in some cases owing to the inactivity of the securities, but we invite inquiries on these and other allied industries' securities when we will endeavor to furnish actual markets.

BONDS	BID	ASKED
Abitibi Fibre Co. 6s, 1947	97	99
Abitibi Power & Paper Co. 6s, 1940	104½	105½
Abitibi Power Paper Co. 8s, 1931	107	
Abitibi Power & Paper Co. 6s, 1931	100¼	100½
Abitibi Power & Paper Co. 6s, 1950	99¾	100½
Advance Bag & Paper Co. 7s, 1943	105	107
A. P. W. Pulp & Paper 7s, 1945	101	103
American Sales Book Co. 6s, 1939	102	
American Writing Paper Co. 6s, 1947	92	
American Book Co. 6s, 1928	100	101
Beaver Products 7½s, 1942	109	
Bedford Pulp & Paper 6½s, 1942	98	
Brown Paper Mills Co. 6s, 1935-41		100
British Columbia Pulp & Paper 6s, 1940	87	91
Belgo Canadian Paper Co. 6s, 1942	101¼	103
Bryant Paper Co. 6s, 1942	101	103
Brown Co. 5½s, 1946	99¼	100
Brompton Pulp & Paper Co. 6s, 1935	100	102
Brompton Pulp & Paper 6s, 1946	99	101
Canadian Paper Co. 6s, 1946	98	
Canadian Paperboard Co. 7s, 1937	99	101
Cape Breton Pulp & Paper 6s, 1932	101	103
Celotex Co. 6½s, 1939	100½	102
Central Paper Co. 6½s, 1941	84	85½
Central Paper Co. 6½s, 1930	90	
Central Paper Co. 7s, 1933	87	89
Celotex Co. 6s, 1929	101½	105
Celotex Co. 6s, 1936	97	
Champion Fibre Co. 6s, 1941	99¾	101
Champion Paper Co. 6s, 1935	95	97
Champion Coated Paper Co. 6s, Serial	99½	
Container Corp. of America 6s, 1936	98½	
Continental Paper Products 6½s, 1943	89	92
Crown Willamette Paper Co. 6s, 1951	101½	
Dells Paper & Pulp Co. 6s	95	
Donnacona Paper Co. 6s, 1940	101½	102½
Eastern Mfg. Co. 7s, 1938	90	93
Eddy Paper Co. 7½s, 1931	102	104
Escanaba Paper Co. 6s, 1939	94	96
Filer Fibre Co. 7s	94	98
Fort Orange Paper Co. 7s, 1942	98	100
Fort William Paper Co. 6s, 1946	98¼	100
Fox William Paper Co. 7s, 1931	100	
Gair (Robt.) Co. 5½s, 1942	87	
Gilbert Paper Co. 6½s	90	
Hartje Paper Company 6s	1½	
Hammermill Paper Co. 6s, 1939	100	103
Hoberg Paper & Fibre Co. 7s, 1937	94	97
Howard Smith Paper Co. 7s, 1941	104	105
Industrial Fibre Co. 8s		BW
International Paper Co. 6s, 1941	104½	105½
Itasca Paper Co. 6s	97	
Itasca Paper & Prairie River 5½s	96	
Kalamazoo Vegetable & Parchment 6s, 1938	100¼	
Kieckhefer Container Co. 5½s, 1928-37		99¾
Lake St. John Power & Paper 6½s, 1942 (with bonus)	95	98
Lake Superior Paper Co. 6s, 1941	104	
Manitoba Paper Co. 6½s	98½	99½
Marinette & Menominee Paper Co. 7½s, 1936	103	104½
Mead Pulp & Paper Company 5s	93	96
Menasha Printing & Carton 6½s, 1939	100	
Mengel Co. 7s, 1934	103	
Minnesota & Ontario Paper 6s, 1931	96	98
Minnesota & Ontario Paper 6s, 1950		98½
Minnesota & Ontario Paper 6s, 1930-35		100
Minnesota & Ontario Paper 6s, 1948	95¾	99¼
Michoacan Pulp & Paper 6s, 1945	95	
Michoacan Pulp & Paper 7s, 1929	96	
Monroe Paper Products 7½s, 1932	97	
Munising Paper Co. 6s	97	100
Mekoosa Edwards 6s	96½	100
Ontario Paper & Pulp 6s, 1931	108	110
Orono Pulp & Paper Co. 6s	98	
Oswego Falls Paper 6s, 1941	99	102
Oxford Paper 6s, 1947	103½	104½
Oxford Miami Paper Co. 6s, 1947	98	102
Parker Young 6½s, 1944	97	100
Paterson & Parchment Paper 6s, 1938	101	102
Penobscot Chemical Fibre Co. 6s, 1942	102½	
Port Alfred Pulp & Paper 6s, 1943	101½	102½
Price Bros. Co. 6s, 1943	102½	104
Provincial Paper Co. 6s, 1941	101½	
Queen City Paper Co. 7s, 1933	97½	100
Richardson Co. 6s, 1938	100	
Riordan Pulp & Paper 6s, 1931	100½	102½
Riordan Pulp & Paper 6s, 1942	100	101½
River Raisin Paper 6s, 1936		98
Roland Paper Co. 6s, 1937	99	

(*Continued on page* 1041)

Rhoads Tannate Leather Belting



A GIANT LEATHER BELT WITH A GIANT'S GRIP.

Capacity exceeds 2,000 H. P. at 4,000 f. p. m.

The picture— The largest belt ever built by Rhoads, as it is going on the pulleys.
Width— 76 inches.
Plies— 4. Waterproof cemented.
Length— 100 feet.
Weight— 2500 pounds.
Contains— 450 pieces of leather.
Required— 300 American steer hides.

It is made of Rhoads famous Tannate Leather, with its wonderful Tannate grip.

It drives sixteen beaters in a New York state paper mill on the "group drive" plan.

It is sold under the Rhoads Service Guarantee which applies to all Rhoads Belts, large or small.

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Direct connected pump and motor of improved design and heavy construction for pumping pulp and thick stock. OPEN IMPELLER TYPE. HORIZONTAL SPLIT CASING. Interior surfaces machine finished. All bearings are removable from shaft without taking off any other part.

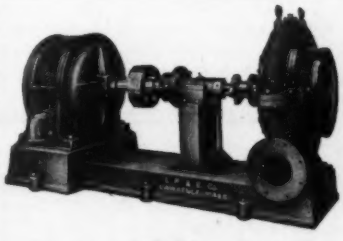

Fig. 57

We build Centrifugal Pumps exclusively—for all requirements

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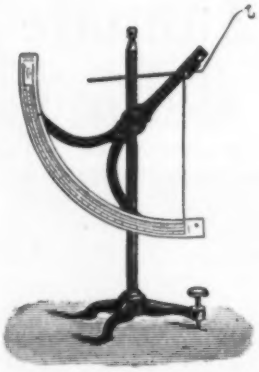
P. O. Box 70B **Lawrence, Mass.**

SCHOPPER

World Standard Paper Testers

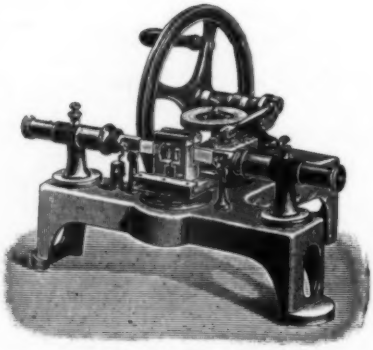


All Kinds of Scales

Patented

Schopper-Riegler Beating Tester
Uniformity of beating means better paper.

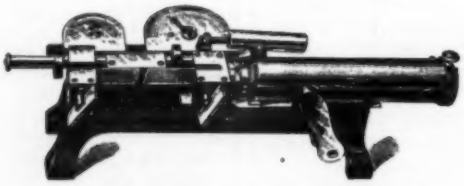
The Schopper Standard Desk Micrometer
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.



Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester

Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



Rapid Strength and Stretch Tester

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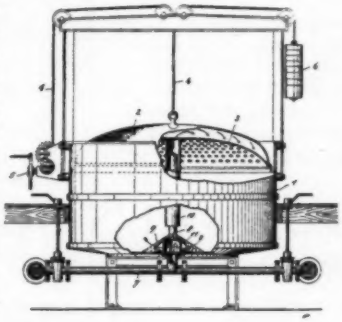
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Pure Cellulose from Bagasse

THE sugar cane bagasse is first treated with a solution of three to five per cent of lime and then it is boiled under pressure in a solution of about six per cent of caustic soda combined with a solution of two to three per cent of sodium salts until all the foreign matter has been dissolved and separated from the cellulose. The cellulose thus obtained is cleaned with fresh steam after the solutions have been drawn off and then it is bleached. The apparatus in which this process is shown in the accompanying illustration. United States Patent No. 1,630,147.



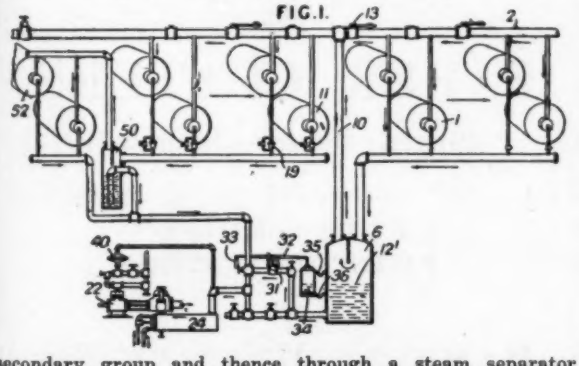
Coated Paper

IN THE production of coated paper which has a "laid" appearance and at the same time a smooth and even surface suitable for printing half tones, any suitable stock which has a light color is first coated on both sides with a water soluble ground coat or enamel such as casein or glue containing satin white, or clay with the usual pigment or coloring matter. Series of lines imitating "laid" paper are then printed or otherwise applied while the body ground is still moist to soften the lines, which should coincide as nearly as possible on the two sides of the sheet, and another coating may be applied while the first coating is still damp or after drying, and the surface is then smoothed and polished as by calendering. British Patent No. 267,013.

Drying Paper

PAPER is dried during manufacture by passing the wet web over team heated rollers or cylinders which are divided into primary and secondary groups. The steam passes through the pipe (2) to the cylinders (1) of the

FIG. I.



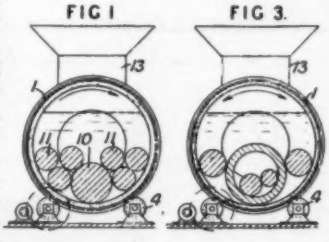
secondary group and thence through a steam separator (6) and pipe (10) to the cylinders (11) of the primary group, additional steam being admitted from the pipe (2) to the primary group of cylinders by opening the valve (13). From the cylinders (11) the steam passes through the steam traps (19) to the second steam separator (50) and thence to the auxiliary drying cylinders (52). The steam separators and the auxiliary drying cylinders (52) communicate through valve controlled pipes with a steam driven air pump (22) which in turn communicates with a condenser (24).

Communication between the air pump and the separator (6) is controlled by means of a weight-operated valve (31) having a pivoted lever (32) carrying a constant weight at one end and a variable weight consisting of a vessel (34), which communicates through flexible pipes (35) and (36) with the separator at the other end. A rise in the level of the condensate in the separator above a predetermined level (12') results in the vessel (34) overbalancing the weight (33) and the opening of the valve (31) thus permitting the condensate being withdrawn from the separator by the air pump. The admission of steam to the air pump is reduced by a valve (4) when the vacuum in the system reaches a predetermined value. British Patent No. 270,122.

Refining Engine

A BEATER or refiner for beating, bleaching, or refining paper and the like stock comprises a closed cylindrical or conical drum (1), see Fig. 1, which is divided if desired into compartments or zones, and a number of rows of free rollers (10) and (11), rubbing on themselves or on the drum as a result of the rotation of the latter. The rollers may be sheathed with sandstone, basalt lava, bronze, or the like, and the drum may be lined with basalt lava or the like. The rollers may be of the same or different lengths and may be ribbed, toothed, or fitted with rivets. The cylinder is mounted on rollers (4), and may be itself driven, or one of the rollers (4) may be driven. A hopper (13) may be provided for feeding and an outlet with cover for delivery to a vat conduit. Hollow rollers may be used and may contain other rollers, as shown in Fig. 2. The beater may be worked continuously, or batches of pulp may be treated. British Patent No. 271,457.

FIG 1 FIG 3.

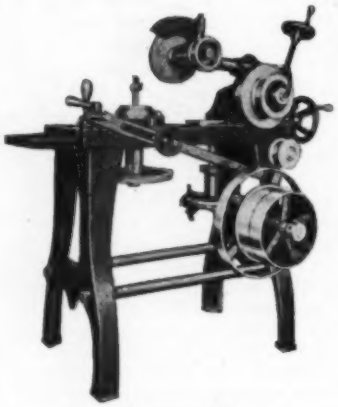


Errors in Sulphite Digestion

LOSSES in digestion occur when the digester is operated for a time without acid, due to the evaporation of the latter, or when the digester is charged with too little acid liquor at the beginning. If it is found that the digested stock contains brownish pieces of wood, then the cause is not insufficient liquor but excessive steaming. It is necessary to make a distinction between brown wood, which is the product of similar character to that obtained in brown steamed pulp, occasioned by the high dry temperatures, the shrinkage and the drying of the wood preventing capillaries from absorbing any more liquor; and black wood, which has not been acted upon at all by the liquor and which has been burnt or carbonized by the hot digester gases.

A digestion which has not been complete may then be due to the fact that the wood has been cooked with too heavy liquor, that the digestion has started too early, has been prolonged too far and that the liquor contains too little lime, often only 0.5 to 0.6 per cent of CaO. Under these conditions the pulp is too hard and gives a poor paper. If this condition has been observed before the cooling water is added to the digester and hence before washing or lifting of the digester

Most Every Paper Mill Has Koegel Equipment



THE STANDARD
Capacity—8½-inch Diam. Slitters

Specifications: Floor space, 27"x 42"; speed of spindle, 55 revolutions; driving pulley, 9"x2½"—speed, 400 revolutions; emery wheel, 7"x⅓"—speed, 3,000 revolutions; weight, about 425 lbs.

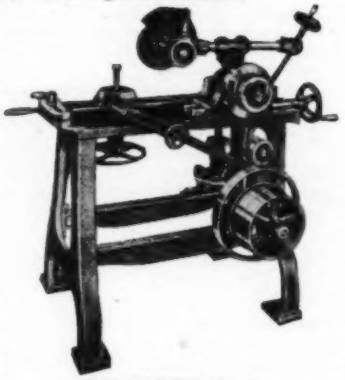
Over 800

Standard Koegel Patent Universal Slitter and Circular Knife Grinders are in the paper and pulp mills of the United States and Canada. What greater evidence could be offered for the universal service this grinder renders?

For Greater Capacity

The Koegel No. 4 Patent Universal Slitter and Circular Knife Grinder is built for Slitters up to 16" in diameter. In mills where larger diameter knives and slitters are used, 150 are in service.

Here are the specifications: Floor space, 32"x52"; speed of spindle, 55 revolutions; driving pulley, 10"x2½"—speed, 400 revolutions; emery wheel, 8"x½"—speed, 3,000 revolutions; weight, about 525 lbs.



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Capacity—16-inch Diam. Slitters

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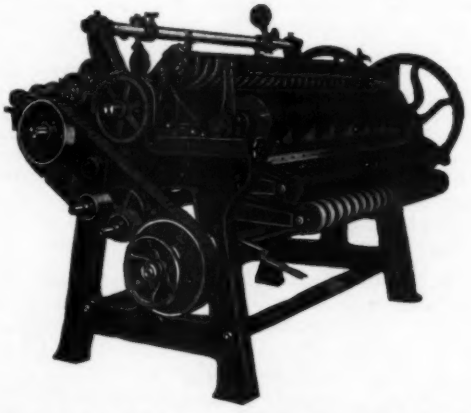


PAPER CUTTERS

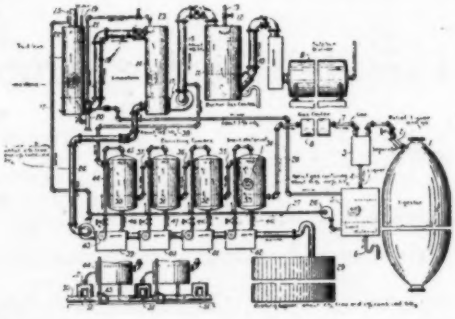
Single—Duplex—Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

HAMBLET MACHINE CO.
LAWRENCE, MASS.

cover, then it is wise to risk a second digestion, for the reason that the liquor might have been too dilute, which can be avoided and for the reason that hydrated stock absorbs new liquor with difficulty only.

If the digester has been raised for example to a temperature of 90 degrees C. and a defect in the operation is detected



for example through the blowing out of packing or through the casting through of the valve housing or of other parts of the digester, the best thing to do then is to blow the digester and to allow the liquor to run out and collect it in tanks for reuse.

After the defect has been repaired, which must be carried out without wasting the stock, then the liquor is added and the digestion proceeds. However the stock that is obtained is suitable only for making seconds because of its dirty grayish color.

If the pressure in the digester cannot be relieved by allowing the gas to escape, then it means that the screen cylinder is stuffed up with pulp and this must be blown out with the aid of steam. An arrangement for accomplishing this, consisting in connecting a steam pipe to the waste line, is shown in the accompanying illustration. Zellstoff und Papier, 1927, pages 313-4.

Improving in Paper Making Machine

TO FACILITATE the changing of the wire of paper machine, particularly of the fourdrinier type wherein the deckle mechanism must be raised and the wire lifted clear of the table to allow the latter to be withdrawn, the breast roll (90), Fig. 15, is mounted on an extensible support (91) and may be moved inwards to slacken the wire by a rack and pinion (93) and (94), or it may be mounted in easily opened bearings on a separate support and run inwards on to brackets (228), Fig. 29, along movable racks (236) put into position for this purpose and then removed. The deckle mechanism is lifted in any desired manner and the

FIG.47

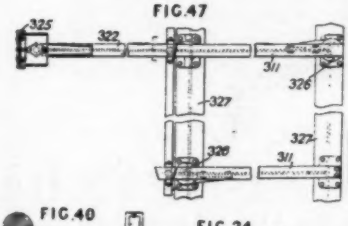


FIG.40

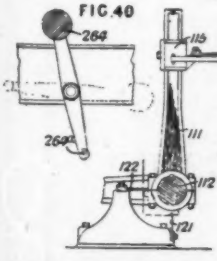


FIG 24

FIG.15

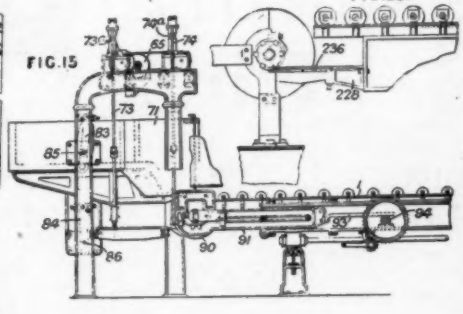
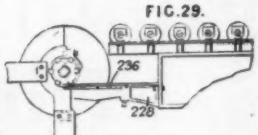


FIG.29.



wire is then hung around light aluminum poles clear of the table. The part of the table carrying the tube rolls (107), Fig. 24, is mounted on flexible elements (109) and shaken by an arm (111) on a roct shaft (112) and connection boxes (115) are specially constructed for easy dissembling. The rock shaft (112) may be mounted in ordinary bearings or at longitudinally spaced points in flexible slab-like supporting elements (121) and (122) of hard wood, such as hickory. The table to be withdrawn is provided with rollers running on transverse tracks and driven from a motor carried by the non-shakable portion of the table.

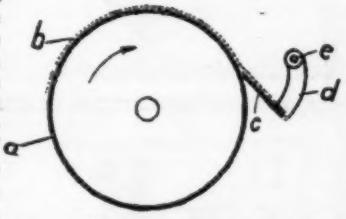
The tracks (311), Fig. 47, may be hinged at (326) to sub-frame beams (327) so that they may be swung into position for the changing of the wire, an extension (322) similarly mounted on the floor of the mill or on the wall (325) being placed in position to receive the table when withdrawn from the wire. Locking, supporting and adjusting means are provided for securing the tracks, the table, the breast roll, etc., in both positions.

The guide rolls (264), Fig. 40, for the wire under the table, are mounted on arms (264a) permitting the rolls to be swung clear of the path of the table, etc., during withdrawal. Means are provided for adjusting the slope of the paper machine.

The feed box (71), Fig 15, is hung on yokes (73) and the feed end of the table section (1) is hung on yokes (74). Both are lifted by a motor (65) acting through plungers (73a and 74a) and gearing. By means of adjustable guideways (83 and 84) and slide pins (85 and 86) on side frames of the feed box, the feed box is tilted about the feed end of the table to ensure a proper feed of pulp. British Patent No. 265,248.

Removing Paper Web from Cylinder

DOCTORS or devices for removing the paper web from the cylinder, which are made in such a manner that they are movable around an axis through their lower ends, and whose free ends move along the surface of the cylinder, exert a pressure on the material that is on the screen drum and on the circumference of the drum itself. This pressure by the weight of the material which is stripped off the drum and which rests for a time on the doctor or stripper. If the circumference of the drum consists of a tough fabric, as in the case of filters, then the pressure of the doctor on the circumference may result in the tearing of the fabric.



This disadvantage is avoided in accordance with the improvement which is patented in German Patent No. 442,153 by making the doctor in such a manner that the weight of the doctor itself and of the material that it strips off the cylinder act to press the doctor away from the drum. The doctor is kept against the cylinder so that it performs its stripping action in the proper manner by means of a counteracting force.

As may be seen from the accompanying illustration, a doctor or stripper (c) rests against the circumference of a drum (a) which carries a layer of pulp (b). The doctor (c) is supported at its lower end by means of the arms (d) to an axis of rotation (e). The weight of the doctor and the material that has been stripped presses the doctor (c) away from the drum (a), so that when the doctor is not working, that is not striping the material from the drum, it does not rest on the drum but at some distance from it.

The new form of stripping device can be used on all

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Skill and Experience
RESULT—
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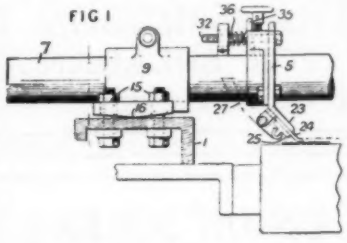
See page 362 in the 1927 Paper and Pulp Mill Catalogue

drums and rolls from which it is desired to strip a layer of pulp or paper. The new form of doctor is not however of any advantage in the case of rollers or drums that have a hard surface, but in all cases where the covering of the drum is of soft material which can be torn, the stripping device is of considerable advantage.

Stationary Deckles

IN STATIONARY deckles for paper making machines, elastic rulers (24) are clamped on two side plates (5) joined at their ends by bars (7) by which they are mounted on the side rails (1) of the paper machine. The rulers (24) are clamped between a bar (23) and a clamp (25) yieldingly and adjustably pressed thereagainst by a number of levers (27) slotted at their upper ends to receive screws (32) having adjusting nuts (35) co-operating with springs (36). The bars (7) are held in blocks (9), each having a fulcrum edge or rib (16) which by manipulation of the nuts (15) permits the necessary tilting of the deckle frame. British patent No. 269,382.

FIG 1

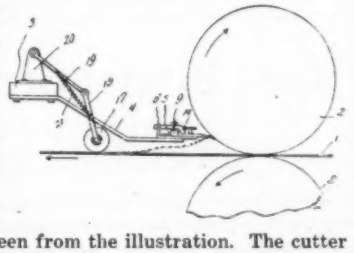


Sulphite Cook Liquor

A SULPHITE cook liquor, containing a high percentage of free sulphur dioxide, comprises the formation of a raw acid liquid of relatively low sulphur dioxide content and then gases which are rich in sulphur dioxide are passed upwardly through a series of masses of confined inert filler while the low sulphur dioxide liquor is maintained at a certain definite level in each of the enriching towers. This liquor is simultaneously circulated downward through the tower filling and the liquid is caused to flow progressively through the pools of liquor in the tower in countercurrent to the flow of the gas and at a rate which ensures the recirculation of the liquor from each pool through the corresponding tower. The result is that the percentage of sulphur dioxide in the liquor is progressively increased. United States Patent No. 1,637,-353.

Paper Making Machine

THE illustration shows an improvement in a paper making machine which is patented in United States Patent No. 1,637,240. The web of paper is shown being stripped from the cylinder roll (2) and falling on the web (1). The web (1) is shown passing between the two rolls (2). The doctor or stripper which removes the paper web from the roller (2) is supported at (2) and is provided with a cutter blade (14) which is supported in an adjustable manner as may be seen from the illustration. The cutter blade makes contact with the roller (2) and thereby strips the paper web from it. A presser roll (17) is also provided which presses the stripped paper web on to the web (1).



Detecting Metal-Injuring Ingredients in Paper

DETERMINING whether or not paper contains materials that injure metals is not only a chemical but also a practical process. Chemical analysis often does not give the desired information, for the injurious substances are mostly present in mere traces only.

The principle on which all testing methods is based is to allow the paper to come into contact with the metal in the form of highly polished steel plates, gold leaf, silver leaf or the like, and then observing the condition of the metal over a long period of time, to see whether or not it is attacked by the ingredients in the paper.

The method used in the governmental testing laboratories in Berlin is as follows: The polished steel plates, made of different grades of steel, are wrapped around with the paper under examination in one part and in another part with a standard paper for comparative purposes, this paper usually being an absolutely pure filter paper. The test sample is then placed in an atmosphere containing 90 to 95 per cent of humidity at the room temperature and observed from time to time. The arrangement of the test is seen in Fig. 1, the metal plate being wrapped around with the paper, glass rods being placed on both sides and being suitably clamped together so that the paper is held fast to the plate. The test is conducted in such a fashion that the humidity in the air chamber cannot reach one hundred per cent and thus deposit moisture on the test piece. The sample is placed under a bell jar which is air tight and contains as well a shallow dish containing potassium carbonate solution, 250 grams of the salt to 750 grams of water.

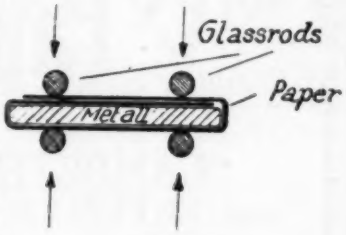


Figure 1

The sample is then examined to see whether or not the plates which are in contact with the test sample rust more than that in contact with the filter paper. If this is so, then the paper contains substances which attack steel and is therefore not suited for covering steel articles. If the degree of rusting is the same in both cases, then the paper can be used for this purpose.

This is a slow method and in order to speed up the determination, so that it is not necessary to wait weeks for the answer to the experiment, the arrangement which is shown in Fig. 2 is employed. The paper is here seen held between a copper and a zinc plate which are rubbed with emery paper before being used but are not polished. They form a galvanic element with the paper that inserted between them. Other metals, which are sufficiently widely separated in the electromotive force series may be used in the place of copper and zinc.

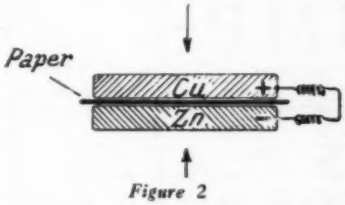


Figure 2

The rate at which the copper plate is attacked is determined by the proportion of harmful impurities that is contained in it. Thus in the case of a paper used for packing needles, the time was ten minutes but as a general rule the time period is as much as one hour. Der Papierfabrikant, 1927, pages 458-9.

Action of Strong Caustic Soda on Cellulose

A TEST was made with various samples of cellulose which were placed in a strong solution of sodium hydroxide and allowed to remain there for a period of several weeks. It was found that the cellulose was changed but little in chemical properties by this treatment. On the other hand when the cellulose is treated with the same liquor in the compressed condition, then it becomes very largely soluble in the solution. Such cellulose shows very clearly defined fibrillae structures under the microscope. This agrees with the solution process, indicating that the cellulose is not a homogeneous substance morphologically. It is very probable that small quantities of oxygen from the air also have an action in the destruction of the fibers. Der Papierfabrikant, Fest und Ausland Nummer, 1927, pages 112-115.

Beater Arrangement

THE beating arrangement which has been used for the most part in beaters up to the present time has been provided with stationary bedplates, so that the major part of the power consumed in the beating operation is used for moving the beaten stock and of the remainder a very large part is converted into heat by friction, so that only a fractional part of the total energy consumed is utilized in

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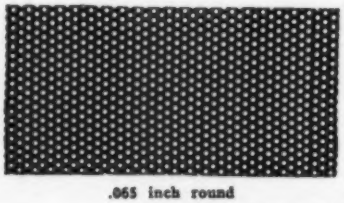
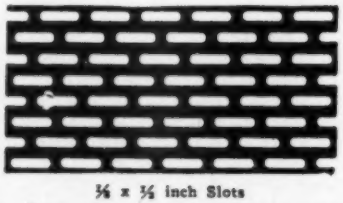
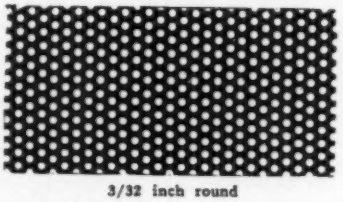


.065 inch round



¼ x ½ inch Slots



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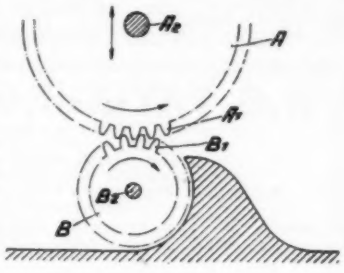
actual beating of the stock. Furthermore, the comminution of the stock takes place exclusively at the circumference of the beater roll and hence essentially in a tangential direction in the beater arrangements with stationary bedplates and also in beater arrangement with rotatable intermediate rolls. The fibers are therefore cut in the transverse direction for the largest part and hence they are reduced in length, while the desired formation of fibrillae is retarded.



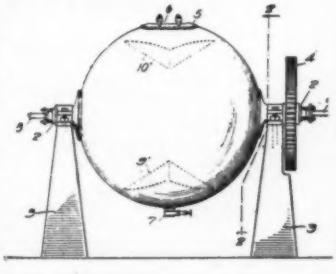
In order to counteract these disadvantages, the beater roll and the rotatable bedplate in the new form of beater are provided with beating members in the form of ribs or the like which are made in the shape of teeth as in gears, so that the teeth on the movable bedplate mesh with these on the beater roll.

As may be seen from the accompanying illustration, the beater roll (A) and the bedplate (B) are provided with interlocking beating members (A^1) and (B^1), which are made in the form of teeth, but they may also be made from steel or metal bars which are set into the roll and bedplate. Various other forms of actual beating members may also be used. These teeth or bars may be distributed over the entire circumferences of both rolls. The distance between the shafts of the two rolls, (A^2) and (B^2) is adjustable and the degree of the fineness of beating can be readily regulated in this manner.

The ratio of the diameters of the two rolls can be chosen to meet local conditions. The lower roll, acting as the bedplate, may be carried along with the beater roll, or it may be provided with its own braking device or it may be driven at a different speed than the beater roll by using special beating devices German Patent No. 443,537.

Bleaching Wood Pulp

THE apparatus which is seen in the accompanying illustration is used for the bleaching of wood pulp. The process consists in enclosing a mixture of pulp and the bleach liquor within this apparatus and then agitating it by subjecting it to alternate spreading and concentrating flow action. The means whereby the apparatus is agitated are seen in the figure, the pressure within the chamber being effected by the addition of the compressed fluid through the hollow shaft of the rotating machine. Agitating blades shown at 9′ and 10′ are secured to the inner wall of the chamber and serve to agitate the contents. This process and apparatus are patented in U. S. Patents Nos. 1,638,886 and 1,638,965.



Removing Incrustating Materials from Wood

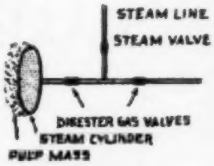
THE raw material has been digested with either high concentrated hydrochloric acid or of 1.21 specific gravity or with concentrated sulphuric acid of 1.64 specific gravity in the processes that have been used up to the present time for the removal of the incrustating materials, such as lignin, at ordinary temperatures and without pressure. The pugnin that is obtained in this manner is of black brown color and of slimy consistency. These methods require considerable time for their operation, such as a treatment lasting several hours with highly concentrated hydrochloric acid or a twenty-four hour treatment with sulphuric acid.

In the new process of dissolving on the lignin and other incrustating matter from the wood, the duration of the operation is very short and the formation of colloidal substances is avoided. This then means that the material can be quickly filtered to give a clear filtrate. The operation is carried out in a vessel which can be agitated and the sawdust or the like is treated with a small amount of a solution of sodium carbonate or strongly diluted hydrochloric acid of 1.60 to 1.645 specific gravity, about ten parts to one part of the material, varying in accordance with the quantity of incrustating material. After agitation for two to three minutes, the material is filtered without any difficulty and the incrustating materials remain behind as crystalline, light brown particles. German Patent No. 441,392.

Studies in Acidproof Bronzes for Pulp Making

AN INVESTIGATION was carried out to determine the resistance of bronzes to the action of sulphurous acid in the digester. Other metals and alloys were also investigated and the resistance of the pure metal was compared with that of the alloy. The effect of temperature and of concentration of the free sulphurous acid in the digester liquid was also determined.

One interesting conclusion derived from these experiments was that the individual metals, making up the bronzes, possess increased resistances in the alloy over what they have when used alone. The acid resistance of the bronze is markedly reduced by the addition of zinc. Tin and lead increase the acid resistance of the alloy. On the other hand the addition of one and one half per cent of antimony also markedly increase the acid resistance.



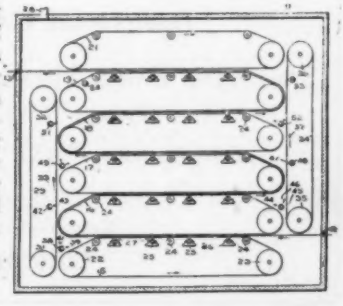
Other interesting conclusions reached were that antimony behaves in bronze just as if it were alloyed with lead and hence it can be used to control the hardness of the alloy. It was also found that the acid resistance of pure copper is greater than that of a zinc-containing bronze and not much less than an antimony-free bronze. Lead and hard lead (antimonial) possess about two to three times the acid resistance of good bronzes. Tin is still more resistant than lead, for it is almost not attacked at all by the sulphurous acid in the digester. Der Papierfabrikant, 1927, pages 473-77.

Dry Distillation of Alkali Waste Liquors

THE process, which is patented in United States Patent No. 1,638,061, is concerned with the dry distillation of alkalized waste liquor which is recovered from the soda pulp process. These waste liquors are first alkalized by the addition of hydrate of lime. Then the liquor is dry distilled in the presence of steam and then such distillation is interrupted at a temperature of approximately 400 degrees C. The retort residue which is obtained in this manner is then removed and granulated to pieces of about three millimeters size and then the granulated residue is burnt at a temperature of approximately 750 degrees C., so that all organic substances in the same are consumed and the lime present in the residue is burnt to calcium oxide.

Paper Making Device

UNITED States Patent No. 1,633,900 is concerned with a paper making device which is seen in the accompanying illustration. It consists of a paper machine containing an upper and lower horizontal belt for moving the web of paper and of means which move in a vertical plane for effecting movement of the web in that direction and pneumatic means for directing the web towards and away from the vertical moving means and away from and towards the moving belts.



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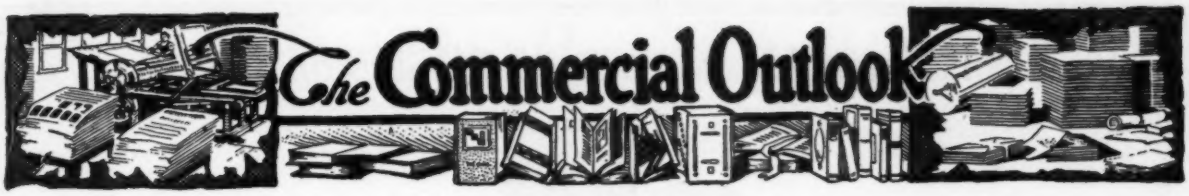

New York, September 1, 1927.

THERE are signs, as well as reports from authoritative quarters in the trade, of improvement in the paper market. It evidently is quite true that demand for most classes of paper is as yet spotty, which is to say that some consumers are buying in a fair way while others are engaging in very little purchasing except to cover actual and immediate needs, but there are indications nevertheless that the market has begun to take on a livelier complexion as the result of increasing activity in some parts of the trade.

The outlook is regarded as quite favorable. It might even be called rosy. There seems no question that consumers and jobbers alike and in various parts of the country have permitted their stocks of paper to get down to an unusually low level, and it is likely they will be in the market as buyers on a broad scale soon after the Labor day holiday and the unofficial ending of the summer and vacation period. Prospects of business in the numerous paper consuming fields are bright. There are plenty of signs to lead one to believe that general business is going to experience marked improvement this fall, and if this comes to pass, there is no doubt that demand for paper of nearly all kinds will expand substantially because if business generally is good the need of paper will bring buyers of this commodity actively into view.

The improvement thus far recorded might be described as the commencement of the customary stimulation of demand for paper and board noted in the autumn. Demand for box board has increased to a marked degree; board mills are busier at present than has been the case in a long time and most of them have enough orders on file to absord their production for at least a month or longer. There has been a better demand for some kinds of paper as well, and, as stated, some spots in the industry are characterized by pronounced activity, which appears to be the forerunner of improvement generally in the industry in the very near future.

Mills of the country produced three per cent more paper and board during June than in the preceding month, according to the monthly statistical summary compiled and issued by the American Paper and Pulp Association. During June a total of 560,342 net tons of paper and board was produced, compared with 543,592 tons in May, following a three per cent decline in output in May as contrasted with April. June production also compared with 558,412 tons produced in April, 596,448 tons in March, 525,896 tons in February, and 515,603 tons in January. These figures show that the June output was the largest in any month during the first half of the year with the lone exception of March. Mill stocks of paper increased a little during June, amounting to 263,088 tons of all grades at the end of that month, against 253,392 tons at the end of May. Shipments from mills totaled 549,517 tons in June, compared with 535,195 tons in the preceding month, and 556,503 tons in April.

Production of newsprint in the United States and Canada continued to be fairly large in July although slightly under the June output, according to the monthly report of the News Print Service Bureau. During July newsprint production in Canada reached 162,564 tons, and shipments from mills were 159,843 tons. Production in the United States amounted to 118,929 tons and shipments 119,840 tons, making a total United States and Canada production of 281,493 tons and shipments of 279,683 tons, contrasted with 295,874 tons produced and 291,218 tons shipped in June. During July 16,876 tons of newsprint were made in Newfoundland and 736 tons in Mexico, so that the total North American production for the month amounted to 299,105 tons, against 313,767 tons in the preceding month. During the first seven months of this year the production of U. S. and Canadian mills totaled 2,054,469 tons, compared with 2,041,415 tons in the corresponding time last year.

The Canadian mills produced 103,443 tons more newsprint in the first seven months of the current year than in 1926, which was an increase of 10 per cent. The United States output was 90,387 tons or 11 per cent less than in the first seven months of 1926, that in Newfoundland 34,145 tons or 34 per cent more, and in Mexico 1,207 tons or 17 per cent greater, making a total North American increase of 48,408 tons or 2 per cent. During July the Canadian mills operated at 80.5 per cent of rated capacity, and the United States mills at 81.5 per cent. Stocks of newsprint at Canadian mills aggregated 32,282 tons at the end of July and at U. S. Mills 27,764 tons, making a combined total of 60,046 tons, which was equivalent to 4.4 days' average production.

The production index number for June for the paper industry was 111, as compared with 113 for May and 124 for June last year, taking 1919 as 100 per cent, according to the United States Department of Commerce's monthly statistical report.

Probably the feature of the market recently has been the sharp increase in demand for boards. Paper box manufacturers and other board consumers have been actively in sight as buyers and have placed orders for large tonnage. It is reported that board mills with few exceptions, and in the East and Middle West, are well sold ahead, and are running at close to capacity. Prices have not changed but there is a strong upward tendency apparent, due both to the bigger demand for board and to the much higher prices board mills have to pay for waste paper—their principal raw material. Plain chip board is quoted in the East at $45 a ton delivered in New York, and filled news board at $47.50.

Consumption of newsprint has dropped off further in recent weeks, as usually is the case at this season. However, as statistics bear out, there is more newsprint being used this summer than in former years, and the outlook is promising. Manufacturers in all probability will enjoy an active demand for print paper later in the year and there likely will be ample buying to absorb all the supply available.

Coarse papers are in good demand and in a firm price position. Converters have brought kraft freely, and a majority of kraft wrapping mills are reported busily engaged and sold well ahead. Tissue is in moderately good demand although this division of the market has experienced the customary quiet midsummer period recently. Prices nevertheless are maintained and show an advancing tendency. Book paper is moving in consistent fashion and in fairly heavy volume for this time of the year, while quotations are steady. Fine papers are relatively quiet but manufacturers are adhering to their former prices and are not altering quotations in the least unless it is to adjust them on a slightly higher plane. Building papers are in slow demand and mills producing them are said to be operating, in most instances, at only about 50 to 60 per cent of capacity.

A meeting of the Superintendents' Association of the Pennsylvania—New Jersey Division will be held in Newark, New Jersey, on October 15, place of meeting and program to be announced later.

On July 7, the name of "Lawrence Machine Co." was changed to Lawrence Machine and Pump Co., with Frank B. Kilborn as manager and Charles L. Lanigan as treasurer.

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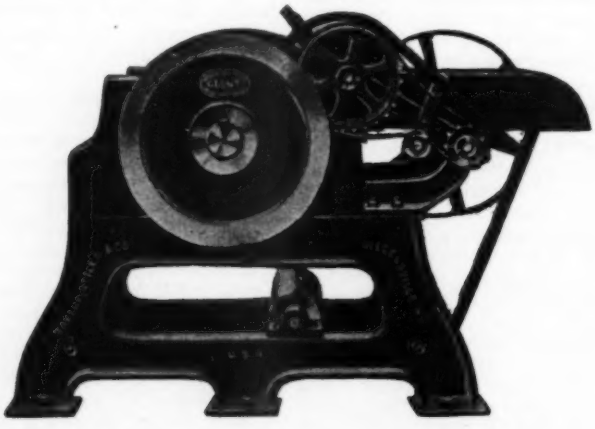

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Papermaking Rags

Demand for rags for papermaking continues quite characteristic of the midsummer season and is at best of narrow compass. There is a fair amount of routine buying being done by paper mills bue it is very evident they are seeking to saisfy urgent and direct requirements only, and, having the element of price in their favor, are permitting the future to take care of itself. Under such demand circumstances, prices of most classes of papermaking rags simply are holding their own. On the other hand, it appears as if the price tone has steadied to some extent; at any rate no further recessions of consequence have been recorded and it is observed that sellers are firmer in their attitude and are a bit more insistent on receiving the prices quoted when negotiating with consumers. It might be said, in fact, that certain grades of rags are firm quotably though this probably is due more to a rather short supply of rags than to any voluminous demand from consuming quarters.

Importation of rags into the United States have been for several months and still are recording a fairly sharp decline. Obviously, this is due to a narrower demand from paper mills in this country, but it also is due in a measure to the refusal of dealers to buy rags abroad on their own account, the policy now in practice among importers being to first secure orders from mill customers before absorbing supplies at primary sources. Government figures show a marked decrease in imports in recent months, and this gives promise of having appreciable influence on the market situation here in time although at present consumers are occasioned no difficulty in covering their wants in almost any class of rags, and at their own prices so long as they are willing to offer figures within reasonable limits.

Roofing stock continues to move into consuming channels in light tonnage. The reason is none other than that roofing felt mills haven't the business necessitating them buying raw material except on a limited scale. Prices as quoted on such rags seem to have steadied, both as regards domestic and foreign grades, and buyers appear to experience difficulty breaking through certain price levels. For instance, foreign dark colored cottons have been bought at 1.50 to 1.55 cents a pound ex dock New York but purchases below this price basis have been practically impossible to effect. Dealers quote No. 1 domestic roofing or cloth strippings at 1.60 to 1.65 cents a pound at shipping points, and No. 2 domestic at 1.30 cents.

New cuttings of some grades display price firmness, dealers holding out for the figures quoted and arguing that they cannot replace stock any cheaper. Usually 12 to 12.25 cents a pound f. o. b. shipping points is asked for No. 1 white shirt cuttings, 6 cents for fancy shirt cuttings, 7 cents for blue overall cuttings, 7 cents for light silesias, 4.50 cents for No. 1 washables, and 5.75 cents for O. D. khaki cuttings.

In old white cottons, a rather easy tone prevails since demand is slow and available supplies apparently ample. No. 1 repacked whites are quoted at 6 cents and higher per pound for the customary run of quality though well above 6 cents is asked for selected packing, while No 2 whites are quoted at around 3 cents. Repacked thirds and blues are selling at 2 to 2.30 cents a pound at dealers' points, and rough blues at around 1.65 cents.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	12.00-12.25
White shirt cuttings, No. 2	7.00- 8.00
Fancy shirt cuttings	5.75- 6.00
Washables, No. 1	4.25- 4.50
Unbleached muslin	9.50- 9.75
White lawns	8.50- 8.75
Overall cuttings, blue	6.75- 7.00
Black silesias	4.75- 5.00
Light flannelettes	8.50- 8.75
Canton flannels, bleached	8.25- 8.50
Canton flannels, unbleached	7.50- 7.75
Shoe cuttings, bleached	8.50- 8.75
Shoe cuttings, unbleached	6.75- 7.00
Light silesias	7.00- 7.25
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	5.00- 5.25
Corduroy cuttings	3.00- 3.25
Cottonade cuttings	3.75- 4.00
Linens, No. 1 white, foreign	13.00-14.00
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1 repacked	6.00- 6.50
Whites, No. 2 repacked	2.75- 3.25
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.75- 6.00
Thirds and blues, rough	1.55- 1.75
Thirds and blues, repacked	2.00- 2.30
Black Stockings	3.75- 4.00
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	2.75- 3.00
Roofing, No. 1 (cloth strippings)	1.60- 1.70
Roofing, No. 2	1.30- 1.40
Linsey, garments, foreign	1.65- 1.75
Dark colored cottons, foreign	1.50- 1.60
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.25
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.75- 2.00

Rope and Bagging

Reports tell of a steady movement of old rope into paper mill channels. It is true that consumers of this article are buying cautiously or against definitely known needs, but signs are that virtually all the supply of good-quality rope reaching the market is finding a ready sale among mills. Moreover, prices have assumed a firmer undertone following the recessions noted a month or so ago and dealers are holding steadily for what they consider full market rates.

Domestic No. 1 old manila rope is bringing 4 cents a pound f.o.b. shipping points, and probably in some instances up to a quarter of a cent per pound more is being granted by consumers. Foreign old rope of prime quality is selling at $3.50 ex dock New York and other American Atlantic ports. Mixed strings are moving freely on a price basis of around 1.15 cents per pound at shipping points.

Bagging is in fair demand, and steady quotably. Dealers report sales to paper mills at 1.65 cents a pound at shipping points for No. 1 scrap burlap, and 1.20 cents for roofing bagging. Gunny is quoted around 1.90 cents a pound f.o.b. producing points and ex dock New York.

F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.85-2.00
Gunny, No. 1 foreign	1.80-200
Scrap bagging, No. 1	1.60-1.70
Roofing bagging	1.20-1.30
Wool tares, heavy	2.25-2.50
Wool tares, light	2.00-2.25
Manila ropes, No. 1 foreign	3.50-3.75
Manila ropes, No. 1 domestic	4.00-4.25
Sisal strings	1.75-2.00

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Mixed strings 1.10-1.25

Old Paper

Sharp advancement in prices in New York has brought about a decided change in the old paper market whereby a strong tone now is evident and more or less of a boom condition exists. The improvement in the market appears based on healthy circumstances. Board manufacturers, encountering a much better demand for their product in August, came actively into the market to absorb substantially larger tonnage of waste paper, and, with collections at a low ebb owing to the non-profitable market prices which had prevailed for some time, values hopped upward at a rapid pace—the New York market advancing some $4 to $5 a ton for the low grades of stock within the comparatively short period of about ten days.

Sales of folded news have been reported at 70 cents a hundred pounds f.o.b. New York, and of No. 1 mixed papers at 65 cents. Probably these prices have been exceeded in some instances; in fact, the market is so strong at present that prices are mainly nominal—it is likely that by the time this report is published the prices mentioned will be away out of line as market levels in all likelihood will be much higher.

Book stock has been firm and has been sold at .30 cents a pound f.o.b. New York for No. 1 heavy books, and 1.05 cents for crumpled books. Old kraft paper is bringing 2.10 cents and higher at dealers' shipping points, and shavings have mounted in price to where dealers ask 3.25 cents per pound and more for No. 1 hard white and at least 3 cents for soft white shavings at points of shipment.

The following quotations, which should be regarded as nominal, are those named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	3.25-3.50
Hard white shavings, No. 2	3.00-3.25
Soft white shavings	3.00-3.25
Colored shavings	1.25-1.50
Heavy book, No. 1	1.30-1.40
Crumpled book, No. 1	1.00-1.10
Ledger stock	1.50-1.75
Kraft, No. 1	2.00-2.15
New kraft cuttings	2.60-2.80
Manilas, No. 1	.90-1.00
White blank news	1.75-1.90
Overissue news, No. 1	.85- .95
Folded news	.70- .80
Sulphite mill wrappings	.80- .90
Old corrugated boxes	.75- .80
New corrugated box cuttings	.90-1.00
Mixed paper, No. 1	.65- .75
Common paper	.45- .50

Pulpwood

Moderately good activity is reported for pulpwood, and the market exhibits a steady undertone. Contracts have been placed in most part for this season and the principal movement of supplies is against contractual commitments, transient demand being at a rather low ebb. No changes of note are reported in quotations.

A census report issued by the U. S. Government shows that the United States consumed nearly 700,000 cords more of pulpwood in the calendar year of 1926 than in 1925, and that New York State ranked third in the amount of pulpwood consumed during the year, with Maine and Wisconsin leading. In New York State a total of 990,701 cords were used in 1926.

Mechanical Pulp

Judging from indications and the reports from members of the trade, the market situation in mechanical pulp is going from "bad to worse." There is very little demand of consequence for ground wood in the open market. Consumers continue to satisfy their needs with pulp which they themselves are grinding in most instances, and producers who

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Jute Pulp
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DRY AND PULP COLORS
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Paper Makers Chemical Co., Easton, Pa., Holyoke, Mass.
Western Paper Makers Chemical Co., Kalamazoo, Mich., Pensacola, Fla., Jacksonville, Fla., Savannah, Ga., Comstock, Mich.
C. K. Williams & Company, Easton, Pa., Emeryvilla, Cal., Malaga, Spain.
Georgia-Louisiana Company, East Point, Ga., Marrero, La.
Superior Pine Products Company, Fargo, Ga., Tarver, Ga.
Empire Size & Chemical Co., Albany, N. Y.
Adirondack Mineral Co., Carthage, N. Y.
Superior Sizing Company, Lockport, N. Y.
Paper Makers Importing Co., Easton, Pa., St. Austell, Cornwall, Eng.
Vera Chemical Co. of Canada, Ltd., Freeman, Ontario
Vera Chemical Corporation, Stoneham, Mass.
Vera Chemical Company, North Milwaukee, Wis.
John Regnier & Son Company, Boston, Mass.
George S. Mepham & Company, East St. Louis, Ill.
Pochins & Paper Makers Chemicals, Ltd., Erith, Kent and Manchester, Eng.

have supplies they are anxious to sell are having unusual difficulty locating an outlet for their pulp. The whole condition simmers down to the fact that there is more ground wood than the consuming market requires, which is the case not only in this country and in Canada but also in Europe where the market rules weak despite the agreement of the Scandinavians to curtail their output drastically.

Prices of ground wood are very uncertain. It is asserted that sales of prime spruce ground wood have been made in certain cases down to as low a basis as $20 per ton f.o.b. grinding mills in Canada. This seems quite probable as frequent offerings by producers at around $23 and $24 a ton at shipping points have been noted. Canadian ground wood is reported to have been sold at $33 a ton delivered in the Kalamazoo papermaking district, and at $27 a ton ex dock New York. Scandinavian ground wood is reported available at $28 a ton for wet and $30 for dry pulp on the dock at New York or other American Atlantic ports.

Production of ground wood in the United States in June amounted to 84,248 net tons, showing a sharp decrease from the 104,125 tons produced in the preceding month, according to the American Paper and Pulp Association. Mill stocks at the end of June aggregated 155,107 tons, contrasted with 158,445 tons a month previous.

Chemical Pulp

There is a fairly good movement of domestic pulps on contract but fresh demand is reported rather slow in developing. Most consumers appear to have their needs covered for a time and are not particularly keen about buying further ahead, presumably figuring they will experience no difficulty in getting such supplies as they may require later in the year. The price tone is moderately steady nevertheless. The market is feeling the influence of comparatively low prices abroad, yet domestic manufacturers are maintaining their quotations fairly well and seem to be securing the prices asked in most cases, especially on well-known brands of pulp which consumers are accustomed to using.

Bleached sulphite of prime quality is quoted at 4 to 4.75 cents a pound f.o.b. pulp mills, depending on grade and tonnage. Strong unbleached sulphite of news quality is on a price level of around $52 a ton, and of book quality at $58 per ton. Bleached soda pulp is quoted at 3.25 to 3.50 cents at producing plants, and No. 1 kraft pulp at 2.75 to 3 cents.

During June mills in the United States produced 107,080 net tons of chemical pulp of all grades, contrasted with 107,424 tons in May, and had stocks on hand totaling 19,657 tons at the end of June, against 19,561 tons a month previous, according to the monthly summary of the American Paper and Pulp Association.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	4.00-4.75
Easy bleaching sulphite	2.90-3.15
Unbleached sulphite, No. 1 strong (news grade)	2.50-2.75
Unbleached sulphite, No. 1 book	2.80-3.00
Soda pulp, bleached	3.25-3.50
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

Quoted prices of casein continue on relatively high levels and are marked by steadiness, producers and importers asking around 17.50 cents per pound for domestic and 18 cents for foreign casein. Demand for bleaching powder is reported good and quotations are maintained on a range of 2 to 2.40 cents per pound in large drums f.o.b. works. Caustic soda is steady at 3 to 3.10 cents a pound at works and in some instances spot lots are commanding a slight premium over these prices, while soda ash is quoted at 1.32½ cents a pound packed in bags f. o. b. works.

Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	4.00 - 4.25
Bleaching powder	2.00 - 2.40

Starch

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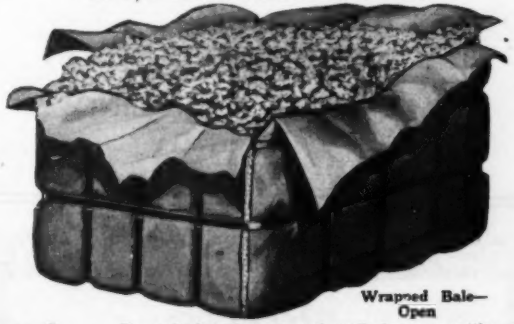
33 1/3 SAVING AT BEATER



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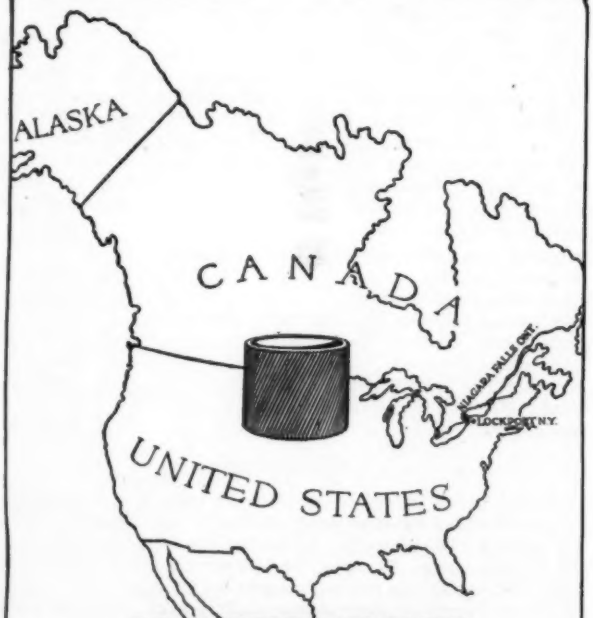

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White sulphite	9-30
Colored rag	15-40
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White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
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White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
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No. 1 S. & S. C.	6.40- 8.00
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English finished	6.25- 8.00
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Newsprint—	
Rolls, contract	3.25-.....
Rolls, transient	3.50-.....
Sheets	3.65- 3.80
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .80
No. 1 manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.25- 5.50
Southern kraft	4.75- 5.00

Boards—	New York and Chicago
Solid news	50.00-55.00
Straw	52.50-57.50
Plain chip	45.00-47.50
White coated chip	57.50-62.50
Manila coated chip	52.50-57.50
Binder's board	70.00-75.00

Chemicals

(*Continued from page* 1039)

Brimstone (long ton, at mine)	18.00	-19.00
Casein (duty paid)	17.00	-18.00
Caustic soda, spot delivery	3.00	- 3.20
China clay, domestic washed	8.00	-10.00
China clay, foreign	14.00	-20.00
Rosin, grade E	10.85	-....
Satin white	2.00	- 2.25
Soda ash, 50 per cent light (bags)	1.32½	-....
Starch, papermakers', in bags	3.07	-....
Talc (ton)	16.00	-18.00

Market Quotations

(*Continued from page* 1023)

St. Anne Paper Co. 6½s, 1946	97¼	99½
St. Croix Paper Products 5s Serial	97½	
St. Regis Paper Co. 6s, 1931	100	101
Spanish River Pulp & Paper 6s, 1931	100	
Southern Advance Bag & Paper 6s, 1947		100
Stevens & Thomson Paper Co. 6s, 1942	94½	96
Sauquoit Paper Co. 6½s, 1938	95	97
St. Lawrence Paper Mills 6s, 1946	97	99
Tomahawk Kraft Paper Co. 7s, 1928-33	95	98
Taggart Bros. 6s, 1944	105	108
Tait Paper & Color Industries 6s, 1934	90	92
Ticonderoga Pulp & Paper Co. 6s, 1940	99	
Warren (S. D.) Co. 6s, 1945	102	
Watab Paper Co. 6½s, 1942	102	103
Wayagamack Paper & Pulp 6s, 1951	99	
Western Quebec Paper Co. 6½s, 1948		75
Whitaker Paper Co. 7s, 1942	107	108
Whitman Parsons Pulp & Lumber 8s units	50	60

STOCKS

Advance Bag & Paper Co. Pfd.	98	
Abitibi Power & Paper Co. Common	107	107½
American Book Co.	144	148
American Sales Book Co. Common	63	
American Sales Book Co. Pfd.	102	
American Tissue Mills Co. Pfd.	90	92
American Writing Paper Co. Ctfs.	20	20½
American Writing Paper Co. old Pfd.	1½	
Atlantic Pulpwood & Paper Co.		BW
A. P. W. Pulp & Paper Pfd.	97	97½
Androscoggin Pulp Co. Common	30	
Androscoggin Pulp Co. Pfd.	90	
Burt Co. Common	61	63
Belgo Canadian Paper Co. Pfd.	104	
Brompton Pulp & Paper Co. Common	37	38
Beaver Board Co. Pfd.	38	40
British Columbia Pulp & Paper Pfd.	70	75
Brompton Pulp & Paper Co. 8% Pfd.	98	
Brown Corp. Pfd.	104	
Canadian Bag Co.	180	
Canadian Paperboard Co. 7% Pfd.	80	
Celotex Co. Pfd.	87	
Champion Fibre Co. 7% Pfd.	107½	110
Champion Coated Paper Co.		125
Champion Coated Paper Co. Pfd.	111	115
Champion Fibre Co. Common	250	
Crown Willamette Paper Co. Common		10
Chemical Paper Mfg. 1st Pfd.	90	
Chillicothe Paper Co. Pfd.	100	
Creamery Package Co. Pfd.	99½	101½
Dien & Wing Co. Pfd.	92	97
Donnacona Paper Co. Common	65	
Donnacona Paper Co. Pfd.	99	
Downington Paper Co. 1st Pfd.	101¼	
Dryden Paper Co., Ltd.		14½
Eastern Mfg. Co. Pfd.	25	28
Eddy Paper Co. Common	26	28
Escanaba Paper Co. Pfd.	40	
Fidalgo Pulp Mfg. Co. Common		75
Fidalgo Pulp Mfg. Co. Pfd.		105
Frazier Co. Pfd.	OW	BW
Frost & Wood, Ltd. Pfd.	45	
Gair (Robt.) Common	12	
Globe Folding Box Co. 6% Pfd.	70	
Great Northern Paper Co.	63	65
Hammermill Paper Co. Pfd.	106	110
Hinde & Dauch Pfd.	101	
Holyoke Card & Paper Co. Pfd.	170	
International Pulp Co. Pfd.	60	65
International Paper Co. Pfd.	102⅝	102⅞
International Paper Co. 6% Pfd.	90	
Jessup & Moore Paper Co. 1st Pfd.	55	65
Jessup & Moore Paper Co. Common		20
Louis De Jonge Paper Co. Pfd.	95	97
Marathon Mille Common	125	
Mengal Co. Pfd.		89
Mead Pulp & Paper Co. Pfd.	103	104
Minnesota & Ontario Paper 6% Pfd.	75	80
Munising Paper Co. Pfd.	80	90
Munising Paper Co. Common	20	30
Missisquoi Pulp & Paper Pfd.	95	100
National Paper & Type Pfd.	35	40
Oglesby Paper Co. Pfd.	95	
Occident Pulp & Paper Mills Co.		20
Oxford Paper Co. Pfd.	108	
Oxford Paper Co. Common	168	172
Penobscot Chemical Fibre Co. Common	75	85
Port Alfred Pulp & Paper Pfd.	95	98
Provincial Paper Co. Pfd.	99	101
Price Bros.	60	
Package Paper & Supply Units	22	
Quebec Pulp & Paper Units	65	
Richardson Co. Pfd.	105	
Rubberoid Co. Pfd.	69	71
River Raisin Paper Co.	7¼	8¼
Robertson Paper Co. Pfd.	6	
Spanish River Pulp & Paper Mills Com.	104½	
Spanish River Pulp & Paper Mills Pfd.	120	
Scott Paper Co. Pfd.	99	101½
Sefton Mfg. Co.	98	102
St. Croix Paper Co.	160	
St. Regis Paper Co. Pfd.	102½	103½
United Paperboard Co. Common	17	18

(*Continued on page* 1051)

QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

KOOS BAC
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EXPORTS

There was a fair increase, in point of value, in exports of paper from the United States during June last as compared with the preceding month, and also an appreciable gain over the corresponding month a year ago, according to official statistics compiled and issued by the United States Department of Commerce in Washington. Total exportations of paper of all classes in June this year reached a value of $2,537,484, contrasted with exports valued at $2,159,740 in May last, and with shipments of a value of $2,138,190 in June, 1926.

Exports of newsprint dropped off a little in June as against the preceding month, amounting to 2,238,471 pounds of a value of $112,700 in June, compared with 2,627,198 pounds of a value of $128,340 exported in May of this year, and also were less than the 3,023,795 pounds of a value of $135,-773 exported in June a year ago. The largest exports of newsprint in June last were to South America, amounting to 774,588 pounds; to Cuba, 572,927 pounds, and to the Philippines, 513,225 pounds.

Exportations of book paper, not coated, from the United States in June recorded a gain over the preceding month, amounting to a total of 1,501,829 pounds of a value of $128,790, against 1,242,090 pounds of a value of $111,932 in May, and 1,266,345 pounds of a value of $156,115 in June, 1926. Wrapping paper was exported from this country to the amount of 3,057,326 pounds of a value of $211,698 in June this year, contrasted with 2,623,489 pounds of a value of $172,149 in the same month last year, and writing paper exports in June were 988,461 pounds, valued at $141,497, against 761,915 pounds of a value of $107,475 in June a year ago. Exports of box board in June totaled 4,379,555 pounds, valued at $123,436, compared with 5,884,553 pounds of a value of $159,694 in the similar month of 1926. Exports of hanging paper increased from 668,050 yards of a value of $18,161 in June a year ago to 1,073,669 yards of a value of $24,158 in June this year, and exports of toilet paper jumped to 515,945 pounds of a value of $57,319 in June last, as contrasted with 326,665 pounds of a value of $44,316 in the corresponding month a year ago.

Total exports of paper of all kinds from the United States during the first six months of 1927 were valued at $13,866,-981, showing a slight gain over the shipments aggregating in value $13,448,153 in the same period of 1926.

IMPORTS

Wood Pulp

While signs point to a fairly good business transpiring in imported wood pulp, demand is developing in a decidedly spotty manner. Some paper and board manufacturers are reported buying in a moderately active way, not only for shipment from abroad during the remainder of this year but also for delivery in 1928, whereas there are other consumers who, it is said, can hardly be prevailed upon to place orders at present unless they are actually in want of supplies. Consequently, good business is noted in some parts of the market, and elsewhere distinct quietness prevails.

The price tone would appear to be somewhat steadier. At any rate, prices seem to have settled, and it is observed that in a great majority of cases sellers are less inclined to grant concessions in order to effect sales. Mills in Scandinavia and other parts of Europe are reported well sold up for the balance of 1927, and some of them have booked sizable orders for the next year's shipment. The feeling exists there, according to advices, that if further changes are to be witnessed in market prices over the next several months, they most certainly will be upward as prevailing prices afford manufacturers virtually no margin for profit over and above production costs. This accounts in part for the firmer attitude taken by European shippers, and their refusal to reduce prices any more as an inducement to consumers in the United States to buy. As regards certain mill brands of sulphite and kraft pulps which are well known in this country and which American paper mills are accustomed to using, a decidedly firm price tone is noted. Such pulps are stated to be well sold up, and buyers are not hesitating to grant premiums in prices to get the supplies desired. On the other hand, there are some grades of pulp being offered at prices somewhat under the commonly-named market levels, and consumers here manifest little disposition to buy them. This makes for a rather wide quotational range on the various classes of pulp.

Strong upbleached sulphite of prime quality is quoted at 2.50 to 2.60 cents per pound ex dock New York generally, but some of the better grades are held for 2.70 and 2.75 cents and higher, whereas it is reported sales of certain brands have been made at a bit below 2.50 cents. Half-prime sulphite is selling at 2.35 to 2.40 cents on the dock, easy bleaching sulphite at about 2.90 cents, and bleached sulphite at 3.50 cents upward, some of the desirable brands of bleached being quoted firmly at 4 cents and higher. Kraft is quoted at 2.70 cents per pound ex dock New York, which is the basis named by the mill association in Sweden. It is asserted that importers in some instances are shading this price a dollar or two per ton, presumably cutting their commission. Ground wood is in dull demand and is quoted at about $30 a ton ex dock New York for dry pulp.

Importations of chemical wood pulp into the United States in June showed a little decrease as compared with the preceding month, amounting to 98,199 long tons of all grades, against 104,444 tons in May, according to official Department of Commerce statistics. June imports brought the total for the first half of this year up to 580,858 tons, giving a monthly average of 96,809 tons, contrasted with a monthly average of 99,838 tons in the corresponding period a year ago. Ground wood imports in June were 18,103 long tons, compared with 15,372 tons in May, and made a total for the first six months of 1927 of 99,925 tons, against 119,427 tons in the same time a year ago.

Current market quotations ex dock New York and receipts at the port of New York during August follow:

Bleached sulphite, No. 1	3.50- 4.00
Unbleached sulphite, strong No. 1	2.50- 2.75
Unbleached sulphite, No. 2	2.35- 2.50
Easy bleaching sulphite	2.80- 3.00
Mitscherlich unbleached, genuine	2.90- 3.15
Mitscherlich unbleached, ordinary	2.50- 2.70
Kraft, standard Swedish	2.65- 2.90
Ground wood, per ton (dry)	30.00-34.00

Castle & Overton, 775 bls. from Rotterdam, 547 Bremen and 22 Antwerp; M. Gottesman & Co., 5,200 bls. from Sebenico and 350 Rotterdam; E. M. Sergeant Co., 3,056 bls. from Gothenburg, 825 Oslo and 3,450 Hernosand; Buck, Kiaer & Co., 400 bls. from Gothenburg; W. Hartmann & Co., 250 bls. from Hamburg; E. J. Keller Co., 1,518 bls. from Hamburg; Parsons & Whittemore, 180 bls. from Hamburg; J. Andersen & Co., 1,050 bls. from Hamburg, 250 Gothenburg, 5,600 Hernosand and 2,500 Stugsund; Chemical National Bank, 383 bls.

The Pulp and Paper Trading Co.

21 East 40th Street New York City

Dealers in
Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
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E. B. EDDY COMPANY, LTD., Hull, Canada
CANADIAN KRAFT LIMITED, Three Rivers, Canada
Dealers in Wayagamack Kraft Pulp

Howard Smith Paper Mills, Montreal, Quebec
EASTERN AGENTS of Sulphite Pulp
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

J. ANDERSEN & CO.

21 East 40th Street New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

Something Better
In
Fourdrinier Wires

Wisconsin Wire Works

Appleton, Wisconsin

GOULDS

INDUSTRIAL—AGRICULTURAL—MUNICIPAL—RESIDENTIAL

A Type for Every Service

GOULDS PUMPS, Incorporated
SENECA FALLS, N. Y.

PUMPS

MITTS & MERRILL SHEET STOCK SHREDDER

Giving the Beater a Lift

The operation of a beater, with its wear and tear and tremendous power consumption, has one primary purpose, namely, hydration. Any thing that will economically bring about hydration more quickly relieves the beater just that much, cuts down on operating costs and speeds the process of paper making.

The MITTS & MERRILL SHEET & LAP STOCK SHREDDER performs on magazines, books, old paper and boxboard, frozen or dried pulp laps in such a way as to greatly reduce their resistance to hydration when they reach the beater. It gives the beater an economical lift.

Our Shredders are built in sizes with spouts ranging from 18" to 45" wide. We will be glad to quote you on any size adapted to your requirements.

We also build a 100% efficient "Hog" t o reduce pulp mill bark and wood refuse

See pages 378 and 379 in the Paper and Pulp Mill Catalogue

MITTS & MERRILL 1013 Tilden St. **SAGINAW, MICH.**

from Hamburg, 1,100 Oslo and 1,500 Iggesund; Atterbury Bros., 250 bls. from Gothenburg; Pagel, Horton & Co., 2,625 bls. from Gefle; Bulkley, Dunton & Co., 3,250 bls. from Gefle, 5,460 Stugsund, 750 Iggesund, 125 Hamburg and 300 Svartvik; Brown Bros. & Co., 5,000 bls. from Norrsundet; Perkins-Goodwin Co., 700 bls. from Oslo; Equitable Trust Co., 400 bls. from Antwerp; Johaneson, Wales & Sparre, 4,224 bls. from Hernosand, 150 Hamburg, 1,500 Ortviken and 450 Svartvik; Empire Trust Co., 2,250 bls. from Greaker; Central National Bank, 665 bls. from Trieste; Scandinavian Pulp Agency, 145 bls. from Gothenburg, 3,570 Skutskar and 2,250 Wifstavarf; Price & Pierce, 1,225 bls. from Gothenburg; W. Hughes & Co., 8,563 bls. ground wood from Liverpool, N. S.; Order, 1,830 bls. from Bremen, 3,233 Wiborg, 2,072 Kotka, 600 Oslo, 630 Raumo and 128 Hamburg.

Paper Stock

Imports of papermaking rags into the United States during the first six months of this year amounted to 185,662,317 pounds, valued at $4,206,503, showing a sharp decrease from the 248,475,154 pounds of a value of $5,728,505 imported in the same period a year ago, according to official U. S. Government statistics. During the same period imports of waste bagging and waste paper totaled 43,806,601 pounds, against 63,074,467 pounds in the similar time last year, and imports of old rope and miscellaneous paper stock were 28,017,469 pounds, contrasted with 46,248,110 pounds a year ago.

Importations of rags and other papermaking materials were rather light in August, judging from the manifests of steamers arriving at the port of New York during the last month. There were numerous shipments received but they were of small volume generally. Imports of all kinds of paper stock other than wood pulp at New York in August, 1927, these data being taken from manifests of steamers reaching that port during the month, follow:

Old Rope

William Steck & Co., 41 bls.; Chase National Bank, 145 coils; W. Schall & Co., 107 rolls and 174 bls.; Union National Bank, Philadelphia, 245 coils; E. J. Keller Co., 187 coils and 145 bls.; Alfred Bloch & Co., 73 bls.; New York Trust Co., 72 bls.; American Exchange Irving Trust Co., 46 bls.; American Express Co., 1,083 bls.; Bulkley, Dunton & Co., 129 bls.; United Fruit Co., 14 bls.; Ellerman's Wilson Line, 270 coils; N. E. Berzen, 59 coils; Brown Bros. & Co., 513 bls. and 1,894 coils; Order, 67 bls. and 56 coils.

Old Bagging

American Express Co., 48 bls.; A. G. Dunn, 150 bls.; National City Bank, 538 bls.; National Park Bank, 102 bls.; Bank of New York & Trust Co., 36 bls.; Chase National Bank, 258 bls.; Darmstadt, Scott & Courtney, 225 bls.; Manufacturers Trust Co., 93 bls.; National Bank of Commerce, 70 bls.; British Bank of South America, 49 bls.; E. J. Keller Co., 343 bls.; Order, 223 bls.

Rags

Daniel M. Hicks, Inc., 65 bls.; Alexander H. Searle, Inc., 411 bls.; Bulkley, Dunton & Co., 304 bls.; J. Cohen & Son, 94 bls.; M. Lobitz, 23 bls.; J. A. Brookman Co., 44 bls.; William Steck & Co., 135 bls.; Darmstadt, Scott & Courtney, 436 bls.; E. Mayer, 668 bls.; P. J. Johnson, 65 bls.; Economy Wiping Material Co., 62 bls.; I. Hinerfeld, 4 bls.; E. A. Stone Co., 91 bls.; Castle & Overton, 246 bls.; Victor Galaup, Inc., 320 bls.; Salomon Bros. & Co., 7 bls.; S. Stern & Son, 6 bls.; General Fiber Co., 4 bls.; E. Butterworth & Co., 65 bls.; E. J. Keller Co, 835 bls.; Paul Berlowitz, 195 bls.; R. Bishop Mfg. Co., 148 bls.; First National Bank of Boston, 20 bls.; Chase National Bank, 394 bls.; Central National Bank, 28 bls.; New York Trust Co., 175 bls.; Union National Bank, Philadelphia, 441 bls.; Banca Commerciale Italiana, 224 bls.; Bank of New York & Trust Co., 644 bls.; State Bank, 69 bls.; Central Mercantile Bank & Trust Co., 22 bls.; American Exchange Irving Trust Co., 60 bls.; Equitable Trust Co., 86 bls.; Banco Lanocai & Son, 222 bls.; Chemical National Bank, 104 bls.; British Bank of South America, 28 bls.; National Park Bank, 23 bls.;

Dilts

MORE HISTORY!

"Simple facts not foolish statements."

Rebuilding this *one* beating engine to the Dilts NEW TYPE increased the output of this high grade tissue mill from a record of 133 tons in a month with three Sunday runnings to 156 tons with no Sunday operations. And best of all, the quality of the paper was improved.

Read the mill's letter:

"We expect within a short time we shall also have you rebuild our other beater. We are quite satisfied with the results obtained on the first one you rebuilt for us. We find on one grade where our previous tonnage was 10,500 lbs. that we now get 14,500 lbs., due of course, to an increase in the capacity and also the beating time.

"Ignoring entirely this good increase in tonnage we find that the beater handles the stock much faster. It also delivers the stock to the machine in a far more satisfactory condition than the old beater, and this will allow us to run at greater speeds on our paper."

Many good mills are rebuilding beaters to the Dilts NEW TYPE, because they get better results. It is a matter you should look into, because

"Your paper is made in your beaters."

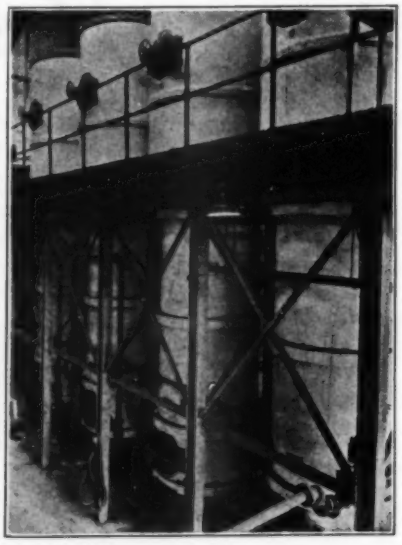
Dilts

MACHINE WORKS, Inc. FULTON, N.Y.

EXPORT OFFICE - 15 PARK ROW - NEW YORK CITY

IMPROVED BADGER BLACK LIQUOR EVAPORATORS

Recent Installation
NORTHWEST
PAPER CO.
Cloquet, Minn.



NON-FOAMING

MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

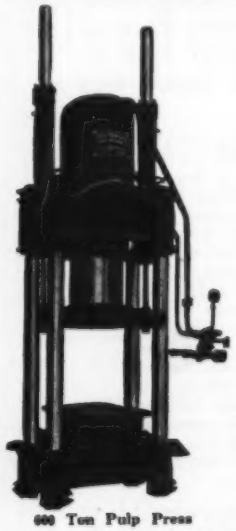
SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1926 Paper and Pulp Mill Catalogue

SOUTHWARK

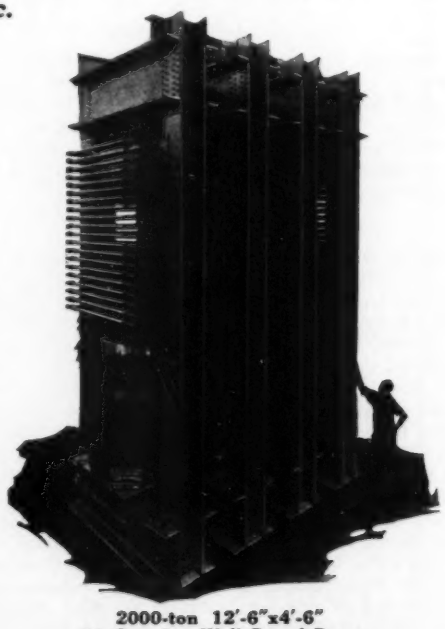
Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.



600 Ton Pulp Press

PULP PRESSES
BALING PRESSES
WALL BOARD PRESSES
PULP TRUCKS
HYDRAULIC PUMPS
ACCUMULATORS
VALVES, FITTINGS, ETC.

Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.



2000-ton 12'-6"x4'-6"
20 Opening Wall Board Press

SOUTHWARK FOUNDRY and MACHINE CO.

400 WASHINGTON AVENUE
PHILADELPHIA, PA.

CHICAGO
343 S. DEARBORN ST.

AKRON
100 E. SOUTH ST.

French-American Banking Corp., 15 bls.; Fidelity Trust Co., 47 bls.; Hanover National Bank, 31 bls.; Dodwell & Co., 10 bls.; Warren Manufacturing Co., 38 bls.; Brown Bros. & Co., 32 bls.; C. R. Spence & Co., 610 bls.; Barrett Co., 93 bls.; American Express Co., 52 bls.; Standard Products Corp., 85 bls.; American Overocean Corp., 238 bls.; Amsinck, Sonne & Co., 182 bls.; A. W. Fenton, Inc., 239 bls.; Amtorg Trading Co., 480 bls.; Kidder Peabody Acceptance Corp., 217 bls.; Goldman, Sachs & Co., 283 bls.; Order, 1,622 bls.

Miscellaneous Paper Stock

Bank of America, 19 bls.; Banca Commerciale Italian Trust Co., 137 bls.; Green, Hamilton & Co., 27 bls.; E. Butterworth & Co., 305 bls.; Milton Snedeker Corp., 166 bls.; Castle & Overton, 263 bls.; J. Cohen & Son, 7 bls.; Guaranty Trust Co., 74 bls.; American Express Co., 29 bls.; Philadelphia Girard National Bank, 37 bls.; National City Bank, 118 bls.; Darmstadt, Scott & Courtney, 337 bls.; Chase National Bank, 115 bls.; Union Waste Co., 104 bls.; Sterling Mill Supply Co., 90 bls.; Salomon Bros. & Co., 60 bls.; Manufacturers Trust Co., 28 bls.; American Exchange Irving Trust Co., 96 bls.; General Fiber Co., 74 bls.; William Steck & Co., 186 bls.; R. Bishop Mfg. Co., 182 bls.; I. Abela & Co., 152 bls.; Anglo-South American Trust Co., 127 bls.; Equitable Trust Co., 105 bls.; International Forwarding Co., 10 bls.; Lombard Trading Co., 45 bls.; D. C. Andrews & Co., 17 bls.; E. J. Keller Co., 388 bls.; Order, 1,896 bls.

Paper

Imports of paper into the United States in June last recorded an appreciable gain as compared with the preceding month and also with the same month of last year, according to official statistics issued by the Department of Commerce in Washington. June paper imports were valued at $13,095,875, against $12,575,523 in May of the current year, and $12,093,560 in June, 1926. Importations of paper of all kinds into this country during the first half of 1927 totaled in value $71,602,973, contrasted with imports of a value of $67,147,135 in the corresponding period a year ago.

Imports of paper during the month of August, 1927, were fairly large, judging from receipts through the port of New York. Some fairly big consignments of printing and wrapping paper were received, and imports of strawboard kept up to a relatively high level. Imports of paper of all kinds through the port of New York in August, these data being taken from manifests of steamers arriving at that port during the month, follow:

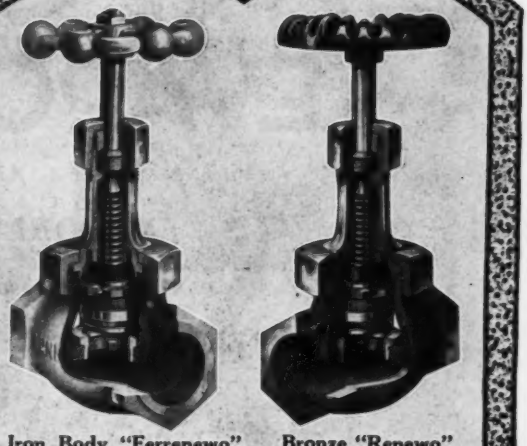
Printing

Perkins-Goodwin Co., 1,068 reels from Bremen and 190 reels and 309 bls. from Hamburg; Keuffel & Esser Co., 109 rolls from Hamburg; E. Dietzgen & Co., 16 cs. from Hamburg and 8 cs. from Rotterdam; Oxford Universal Press, 5 cs. from Liverpool; Ossian Ray, 94 reels from Gothenburg; C. Steiner, 54 cs. from Rotterdam; Bank of Montreal, 9,333 bls. from Corner Brook, N. F.; A. S. Zabriskie, 11 bls. and 158 reels from Bremen; Parsons & Whittemore, 307 reels from Bremen; F. Henjes, Jr., 124 reels and 77 cs. from Hamburg and 3 cs. from Havre; P. C. Zuhlke, 175 cs. from Antwerp; B. F. Drakenfeld & Co., 49 cs. from London; H. Reeve Angel & Co., 11 cs. from Oslo; Walker, Goulard, Plehn Co., 53 cs. from Bremen and 10 cs. from Trieste; Box Board and Lining Co., 134 reels from Kotka; Johaneson, Wales & Sparre, 138 rolls from Ortviken; Hudson Trading Co., 138 rolls from Ortviken; Baldwin Universal Co., 6 reels from London; New Haven Times Co., 111 reels from Gothenburg; Order, 76 bls. from Kotka, 399 reels and 171 cs. from Bremen and 23 reels from Oslo.

Wrapping

National City Bank, 100 bls. and 50 rolls from Genoa; Wedeman, Godnecht & Lally, 10 cs. from Hamburg; Commonwealth Bank, 26 cs. from Hamburg; Thomas Barrett & Son, 94 bls. from Gothenburg; Borregaard Co., 799 bls. and 257 reels from Gothenburg; C. K. MacAlpine & Co., 130 bls. from Gothenburg; E. Dietzgen & Co., 6 cs. from Rotterdam; Sanka Coffee

A COMBINATION
That Will Effect Economies
In Your Plant Operation



Iron Body "Ferrenewo" 150 lb. W. S. P.
Bronze "Renewo" 200-300 lb. W. S. P.

LUNKENHEIMER
"Ferrenewo" and "Renewo"
VALVES

form an economical combination on which to standardize—the Iron Body "Ferrenewo" for the lower pressures and the Bronze "Renewo" for the higher pressures.

Seating surfaces are regrindable and all parts, including the nickel seat and disc, can be renewed without removing valves from pipe lines.

In sizes ¼ in. to 2 in. inclusive all parts of the "Ferrenewo" and medium "Renewo" are interchangeable, excepting bonnet rings.

This feature makes it unnecessary to carry a wide assortment of replacement parts, facilitates repairs, simplifies ordering, and reduces your ultimate valve cost.

Lunkenheimer Distributors, located in all industrial centers, carry complete stocks, and will fill your orders promptly.

Lunkenheimer "Ferrenewo" and "Renewo" Valves are illustrated and described in Folder F 541. A copy will be sent upon request, without obligation.

THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.
NEW YORK CHICAGO BOSTON PITTSBURGH
SAN FRANCISCO NEW ORLEANS
LONDON
EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

102—46-67

BUILT FOR HARD WORK, LONG LIFE, AND NO WORRY TO THE OWNER

ZAREMBA EVAPORATORS

Are Designed By

EVAPORATOR SPECIALISTS

Who will be available for consultation at the

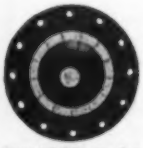
EXPOSITION OF CHEMICAL INDUSTRIES

BOOTH 434

ZAREMBA COMPANY
506 CROSBY BLDG. BUFFALO, N. Y.

NEW YORK OFFICE: 95 LIBERTY STREET

THE MICHIGAN PIPE COMPANY



Special Flange for Paper Mills.

ADVANTAGES:
Saves Power
No Discoloration
Lasting Qualities
Light in Weight
Cheaper.

Manufacturers of

COMBINATION STEEL AND WOOD PIPE

Office and Factory: Bay City, Michigan

PRODUCTS:

Pipe for conveying—Pure Water, Acid Water, White Water, Sulphite Waste Water, Paper Stock, Ground Wood Pulp, Gases

SPECIAL FITTING FOR ACID WORK WRITE FOR CATALOG

Michigan Pipe for Paper Mills
Liquid Conveyed Touches No Metal

Showing the Special Flange Joint, Light in Weight, Specially Desired for Inside Installations. Easy to Take Apart

SERVICE:
We maintain experts who will take entire charge of pipe installations if desired.

Technical Association Papers, Series IX (1926)

IN PAPER, 384 PAGES. $3 PER COPY

Partial List of Contents

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Hand Brush-Outs in the Coating Mill
Semi-Chemical Pulping
Thermodynamic Comparison of Paper Drying Methods
Significance of the Alpha Cellulose Test
Vacuum Drum Washers
Code Comparison of Grinders
Lime Sludge Analysis
Wagner Stationary Recovery Furnace
Strength Tests for Sulphite Pulp
Identification of Piping Systems
Analysis of Water
Glue-Bound Coated Paper
Constitution of Spruce Wood Lignin
Chemistry of the Sulphite Process
Methods of Testing Chemical Lime
Hardinge System of White Water Treatment
Chemistry of Wood Cellulose
Study of the Eastman Colorimeter
Hydrogen Ion Control
Proceedings of the Annual Meeting

Write to THE PAPER INDUSTRY 356 Monadnock Building, Chicago, Illinois

Corp., 19 rolls from Bremen; Wolf Bros., 133 reels from Gothenburg; Arkell Safety Bag Co., 223 reels and 34 bls. from Gothenburg; Maltus & Ware, 29 pkgs. from Antwerp; Robert Wilson Paper Corp., 96 rolls from Antwerp; Birn & Wachenheim, 57 cs. from Antwerp and 10 bls. from Hamburg; F. C. Strype, 28 pkgs. from Antwerp; J. P. Heffernan Paper Co., 2 bls. from Rotterdam; Schenkers, Inc., 135 cs. from Hamburg; Insight Paper Co., 153 reels from Oslo; A. M. Capen's Sons, 10 bls. from Hamburg; Crepe Kraft Co., 67 reels from Gothenburg; Order, 2,200 bls. from Antwerp.

Cigarette

P. J. Schweitzer, Inc., 81 cs. from Marseilles; British-American Tobacco Co., 10 cs. from Liverpool; Surbrug Co., 10 cs. from Havre; Standard Products Corp., 670 cs. from Havre; Southern Pacific Co., 3 cs. from Havre; Liggett & Myers Tobacco Co., 18 cs. from Bordeaux; M. Spiegel & Sons, 9 cs. from Bordeaux and 17 cs. from Hamburg; R. J. Reynolds Tobacco Co., 400 cs. from Havre and 1,340 cs. from St. Nazaire; American Tobacco Co., 900 cs. from Bordeaux; De Manduit Paper Corp., 796 cs. from St. Nazaire; Order, 80 cs. from Marseilles.

Writing

Eleto Co., 14 cs. from Trieste; Keuffel & Esser Co., 5 cs. from Havre; J. D. Smith & Co., 4 cs. from Antwerp; J. E. Bernard & Co., 3 cs. from Havre; Stern Bros., 11 cs. from Havre; Guibont Freres & Co., 8 cs. from Havre and 4 cs. from Southampton; Globe Shipping Co., 2 cs. from Havre; J. W. Hampton Jr. & Co., 14 cs. from Hamburg; Order, 12 cs. from Antwerp.

Filter

A. Giese & Son, 21 bls. from Hamburg, 20 bls. Antwerp and 20 bls. Southampton; C. Sleicher & Scholl Co., 12 cs. from Hamburg; H. Reeve Angel & Co., 22 cs. from London, 29 cs. Antwerp, and 13 cs. Southampton; E. Fougera & Co., 41 cs. from Southampton; Orbis Products Trading Co., 30 bls. from Bordeaux; Blackman & Blackman, 10 bls. from Bordeaux.

Drawing

Keuffel & Esser Co., 170 cs. from Hamburg, 3 cs. London, 9 cs. Rotterdam and 3 cs. Southampton; H. Reeve Angel & Co., 7 cs. from London; International Forwarding Co., 39 cs. from Antwerp.

Tissue

Iwai & Co., 2 cs. from Kobe; Meadows, Wye & Co., 3 cs. from Liverpool and 2 cs. from Hamburg; F. B. Vandegrift & Co., 4 cs. from London.

Hanging

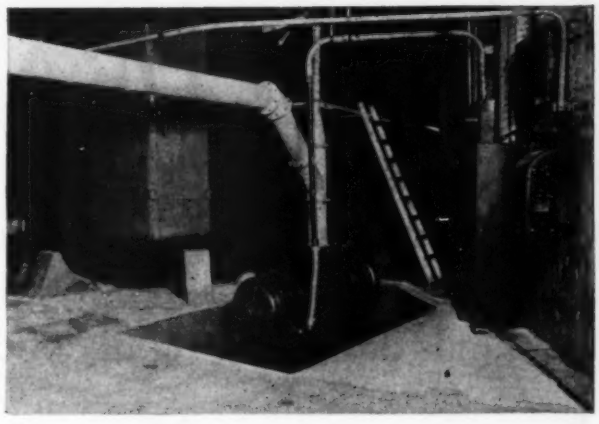
F. J. Emmerich & Co., 9 pkgs. from Hamburg, 3 bls. Liverpool, 3 cs. Southampton and 2 cs. London; A. C. Dodman Jr. & Co., 11 pkgs. from Liverpool, 13 pkgs. Southampton and 4 cs. Antwerp; C. A. Haynes & Co., 5 cs. from Liverpool and 43 cs. from London; W. H. S. Lloyd & Co., 12 bls. from Liverpool; F. A. Binder, 19 pkgs. from Bremen; Atlantic Forwarding Co., 2 cs. from Southamption; International Mercantile Marine Co., 7 bls. from Southampton; R. F. Downing & Co., 2 cs. from Bremen; S. Stern & Son, 6 bls. from Hamburg; J. Hunken & Co., 4 cs. from Hamburg; F. Blank & Co., 13 cs. from Hamburg; Order, 19 bls. from Antwerp and 4 cs. from Havre.

Photo

Globe Shipping Co., 439 cs. from Bremen; J. J. Gavin & Co., 6 cs. from Liverpool; P. C. Zuhlke, 523 cs. from Antwerp; Gevaert Co. of America, 336 cs. from Antwerp; American Express Co., 44 cs. from Antwerp; Order, 96 cs. from Hamburg.

Board

Lagerloef Trading Co., 239 bls. from Bremen, 227 bls. and 97 reels from Helsingfors and 86 bls. from Raumo; Brooks Paper Co., 5 cs. from Liverpool; C. K. MacAlpine & Co., 24 bls. from Gothenburg; Adrian Vuyck, 792 reels from Rotterdam; Faber, Coe & Gregg, 5 cs. from London; Premier Flong



This Warren Stuff Pump

is delivering stock to the beaters in record time.

Its performance is typical of many other Warren installations which are giving pulp and paper makers a new conception of the efficiency and continuous dependability with which stock up to 5% and greater consistency may be handled.

Ask us to show you what the Warren Stuff Pump can save you when handling your particular kind of stock. Write for Bulletin.

Warren

Steam Pump Co., Inc.

Warren, Mass.

BRANCH OFFICES:

Boston, Philadelphia, Dallas, Atlanta, Chicago, Oklahoma City, St. Paul, Scranton, Toronto, New York, Cleveland, San Francisco, Pittsburgh, St. Louis

1217

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

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BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

Co., 66 cs. from Hamburg; Haas Bros., 227 reels from Rotterdam; Perkins-Goodwin Co., 576 rolls from Rotterdam; Spaulding & Tewesbury, 169 reels from Rotterdam; J. P. Heffernan Paper Co., 229 reels from Rotterdam; State Bank, 118 reels from Rotterdam; G. M. Thurnauer & Co., 23 cs. from Antwerp; L. T. River, Inc., 12 cs. from Southampton; Coty, Inc., 15 cs. from Havre; American Express Co., 125 cs. from Hamburg; American Corrugated Paper Products Co., 366 reels from Hamburg; Acme Novelty Co., 12 cs. from Antwerp; F. B. Vandegrift & Co., 8 cs. from London; M. Brown Paper Co., 22 bls. from Gothenburg; Order, 75 cs. from Hamburg.

Miscellaneous

Japan Paper Co., 10 cs. from Marseilles, 17 cs. London, 28 cs. Havre, 13 cs. Southampton and 3 cs. Rotterdam; Horman, Schutte & Co., 18 cs. from Genoa; Hensel, Bruckman & Lorbacher, 12 cs. from Bremen; J. H. Schroeder Banking Corp., 4 cs. from Bremen; Whiting-Patterson Co., 7 cs. from Hamburg and 8 cs. from Southampton; International Forwarding Co., 15 cs. from Hamburg, 16 cs. Rotterdam and 2 cs. Havre; Judson Freight Forwarding Co., 3 bls. from Hamburg and 3 cs from Bremen; Perry, Ryer & Co., 45 cs. from Glasgow; F. L. Kraemer & Co., 3 cs. from London; H. J. Heinz & Co., 7 bls. from Gothenburg; E. M. Sergeant Co., 5 cs. from Gothenburg; S. Gilbert, 83 cs. from Rotterdam; W. Van Doorn, 8 cs. from Rotterdam; F. Murray Hill Co., 5 cs. from Bremen; E. Dietzgen & Co., 21 cs. from Marseilles and 8 cs. from Rotterdam; F. C. Strype, 40 cs. from Hamburg; C. A. Johnson & Co., 22 pkgs. from Liverpool; Phoenix Shipping Co., 13 cs. from Bremen; Graphic Duplicator Co., 8 cs. from Hamburg; American Express Co., 6 cs. from Genoa and 50 cs. from Antwerp; D. C. Andrews & Co., 155 cs. from Hamburg; E. V. Hadley, 19 cs. from Hamburg and 10 cs. from Antwerp; H. C. Neblung, 10 cs. from Antwerp; Heemsoth, Basse & Co., 194 pkgs. from Rotterdam and 60 cs. from Hamburg; Zellerbach Paper Co., 27 cs. from Rotterdam and 13 cs. from Hamburg; Carter, Cummings & Co., 55 pkgs. from Colombo; Keller-Dorian Paper Co., 45 cs. from Havre; P. H. Petry & Co., 16 cs. from Havre, 2 cs. Hamburg and 4 cs. Rotterdam; Coenca-Morrison Co., 2 cs. from Havre; Canson & Montgolfer, 72 cs. from Havre; Tiffany & Co., 5 cs. from Havre; J. C. Robold & Co., 3 cs. from Havre; Tice & Lynch, 2 cs. from Havre; B. Altman & Co., 19 cs. from Havre; Brown Bros. & Co., 6 cs. from Hamburg; G. Henschell & Co., 4 cs. from Hamburg; United Supply Co., 15 cs. from Hamburg; Schenkers, Inc., 3 cs. from Hamburg; Freedman & Slater, 8 cs. from Hamburg; G. W. Sheldon & Co., 4 cs. from London and 2 cs. from Southampton; A. Murphy & Co., 4 cs. from Bremen; Beekman Card & Paper Co., 10 cs. from Hamburg; Bendix Paper Co., 6 cs. from Hamburg; Vernon Bros. Co., 37 cs. from Glasgow; Louis Dejonge Co., 40 cs. from Hamburg.

Market Quotations

(*Continued from page* 1041)

Union Bag & Paper Co.	46½	47
Wayagamack Paper Co.	73	
Watson (H. F.) Paper Co.	125	
Watervliet Paper Co.	10	
Westfield River Paper Co. Pfd.	OW	BW
Western Paper Goods Co. "A"	24	30
West Virginia Pulp & Paper Co. Common	52	54
Whitaker Paper Co. Pfd.	99½	101
Whitaker Paper Co. Common	58	60

QUOTATIONS AS OF AUGUST 30th

The Cutler-Hammer Mfg. Co., of Milwaukee, Wis., announce their Cleveland office moved to Guarantee Title Building, Suite 1905, Cleveland. The new office has approximately three times the space of the old with added facilities for handling their business in that territory.

Effective September 7, carload price F Wood Rosin is $7.50 f. o. b. southern shipping points.

Reliable Wet End Equipment

Reliability is the key-note of Cheney Bigelow "wet end" equipment. Our Fourdrinier wires and cylinder mould covers are made of the best obtainable material and woven with great accuracy and uniformity. You can depend on them for long service.

Our wide experience in building cylinder moulds for the manufacture of all sorts of paper from tissue to box board, enables us to meet the requirements of any manufacturer to the best advantage. When your old cylinders need repairing send them to us.

At short notice we can provide you with dandy rolls with or without watermarking devices, laid or wove.

Orders for brass or bronze wire cloth are almost invariably filled on day of receipt from the large stock we carry on hand.

We also specialize in re-covering cylinders. Our men are expert in fitting covers and sewing the seams so as to ensure best results and longest service.

Cheney Bigelow Wire Works

Springfield, Mass.

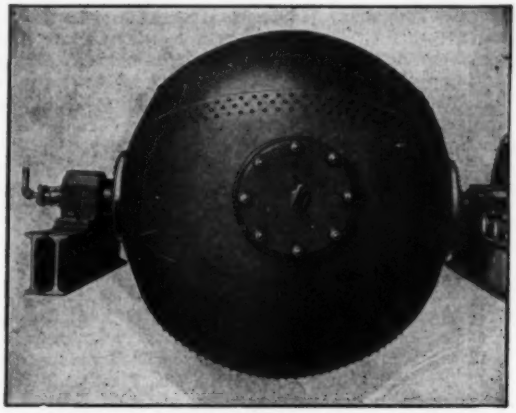
Established 1842

Cut Bleaching Time In Half

Biggs Rotary Cold Bleaching Engines successfully handle pulp up to 35% consistency with a remarkable saving in time, labor and expense.

With the Biggs you can bleach 4 ton batches of from 15 to 20% consistency in one hour—whiter, cleaner and stronger than by any other method.

Biggs Globe and Cylinder Rotary Bleaching Boilers are unexcelled for cooking and bleaching low grade stock. They are built in any size and for all necessary pressures.



Biggs Cold Bleaching Engine (Patents Pending)

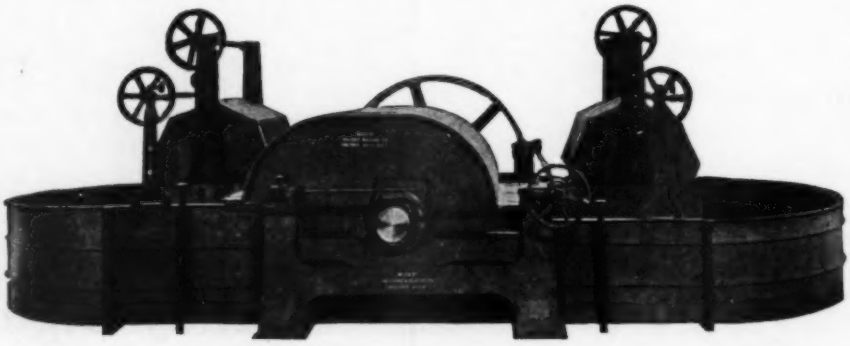
THE BIGGS BOILER WORKS COMPANY
General Offices and Works
Seneca Place and Case Avenue, Akron, Ohio
Eastern Sales Office: 300 Madison Avenue, New York City.
Chicago Office: 35 South Dearborn Street.

The Biggs Boiler Works Co. Akron Ohio — Trade Mark Registered

GLOBE and CYLINDER
ROTARY BLEACHING BOILERS
for Years of Dependable Cooking and Bleaching

Holyoke Machine Co., Holyoke, Mass.

Makers of Improved Machinery for Wood Pulp and Paper Mills



Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors, Super-Calenders, Platers, Cotton and Paper Rolls.